MULHER NORDESTINA: THE EFFECT OF POLITICS, THE ENVIRONMENT, AND PUBLIC HEALTH POLICY ON NORTHEASTERN WOMEN IN BRAZIL

by

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List of Acronyms

BF	*Bolsa Familia* (Family Grant)
BS	*Brasil Sorridente* (Smiling Brazil)
CDC	Centers for Disease Control and Prevention
COES	*Centro de Operações de Emergências em Saúde* (Center of Operations for Health Emergencies)
ESF	*Estratégia Saúde da Família* (Family Health Program)
FDI	Foreign Direct Investment
FNDE	*Fundo de Desenvolvimento do Nordeste* (Development Fund of the Northeast)
FP	*Farmácia Popular do Brasil* (Popular Pharmacy Program)
GDP	Gross Domestic Product
IBGE	*Instituto Brasileiro de Geografia e Estatística* (Brazilian Institute of Geography and Statistics)
MDS	*Ministério de Desenvolvimento Social* (Ministry of Social Development)
MS	*Ministério de Saúde* (Ministry of Health)
PE	Political Economy
PEC	*Proposta de Emenda à Constitução* (Proposed Constitutional Amendment)
PMDB	*Partido do Movimento Democrático Brasileiro* (Brazilian Democratic Movement Party)
PSL	*Partido Social Liberal* (Social Liberty Party)
PT	*Partido dos Trabalhadores* (Worker's Party)
SAMU	*Serviço de Atendimento Móvel de Urgência* (Mobile Emergency Services)
SNPM	*Secretaria Nacional de Políticas para Mulheres* (National Secretariat for Women's Policy)
SUS	*Sistema Único de Saúde* (Unified Health System)
UFPE	*Universidade Federal de Pernambuco* (Federal University of Pernambuco)
UNFPA	United Nations Population Fund for Population Activities
UNICEF	United Nations International Children's Emergency Fund
WHO	World Health Organization

Abstract

In 2016, Brazil's economy was in recession and the country's political system was in crisis that culminated in the end of the leftist Workers Party (*Partidos dos Trabalhadores* [PT]) rule of government by means of impeachment of Dilma Rousseff. At the same time, the Brazilian government and the World Health Organization declared a public health crisis triggered by the Zika virus epidemic that was largely concentrated in the Northeast region of Brazil. The Zika virus is an arbovirus that is transmitted by the common *Aedes aegypti* mosquito, which thrives in tropical environments and areas with poor sanitation and infrastructure. The Zika virus can also be transmitted through sexual activity with an infected person, and there is a strong correlation between the virus and congenital disorders in infants whose parents were infected. The epidemic exposed the government's inability to properly respond to a public health crisis and exacerbated the need to invest in sanitation and infrastructure, as the Zika virus disproportionately affected Brazil's marginalized populations. In other words, the Zika epidemic exposed the region's precarious political ecology and its uneven effects on different segments of society. This research centers on the government's policy response to the Zika epidemic, in tandem with the economic and political crisis, first during the Rousseff administration then abruptly under the Temer administration. Specifically, this research examines the impact of policy changes on organizations (governmental and non-governmental) and individuals affected by the Zika epidemic.

Keywords: politics, public health policy, political ecology, environment, policy fields, state strength, social determinants of health, epidemics, reproductive health care, inequality

Figure 1. By E. Camarena. (2017) Zona da Mata.

CHAPTER ONE | Introduction

Vila de Nazaré, Cabo de Santo Agostinho, Pernambuco – June 2017

Approximately 50 km south of the city of Recife, capital of the Northeastern state of Pernambuco, sits the small beach-side town of Vila de Nazaré on the shores of the Atlantic Ocean in the Cabo de Santo Agostinho municipality. While this location wasn't the exact site of my research, it was a proper introduction to the different faces of Brazil. Vila de Nazaré is rich in history. At the shores of the cove remain centuries-old structures dating back to the Dutch invasion of Recife in the 1600s and fortifications built by the Portuguese to protect the region's wealthy sugar plantations during colonial times. Indeed, at one point in time Recife was one of the most important ports for the Portuguese Crown because from here sugar was exported to the world, and from here entered recently enslaved Africans from Angola to work the labor-intensive sugar fields (Rogers, 2010). Recife was also the Dutch capital during Holland's brief reign of Brazil from 1630-1654 (Rogers, 2010). This colonial history and the legacy of colonialism is scattered throughout Cabo de Santo Agostinho. I arrived at Recife's International Airport on a rainy June night. The streets by the airport were flooded from that day's rain and the taxi driver had to take alternative routes to get to the small town of Vila de Nazaré about 25 km south of the airport. After driving through dense

darkness, going up and down hills, and occasionally passing a few scant lit towns, I finally arrived in Vila de Nazaré where I would be staying for the next couple of weeks. This location would introduce me to the multifaceted issues that are connected to my research.

I woke up the next morning to the sound of rain. I stepped outside and realized I was surrounded by trees and lush vegetation (See Figure 1). Having arrived in the middle of night, I was unaware I was entering a forest, or the *Mata Atlântica* (Atlantic Forest) of the Northeast. The region along the Northeastern coast of Brazil from the state of Maranhão to Bahia (Appendix A) is known as the *zona da mata*, or forest zone, where rain is abundant, and the climate is hot and humid year-round (Rogers, 2010). When the Portuguese arrived in the Northeast in the 16th century, they discovered the *Mata Atlântica*, a dense forest with abundant rivers and fertile soil; the ideal conditions for the agriculture of sugar and other crops (Rogers, 2010). Thus, began a robust transformation of the environment reflected by centuries of massive deforestation of the *Mata Atlântica* to fuel the sugar and coffee industry, cattle farming, and urban sprawl which has since minimized the size of the forest by approximately 90% (Hance, 2010).

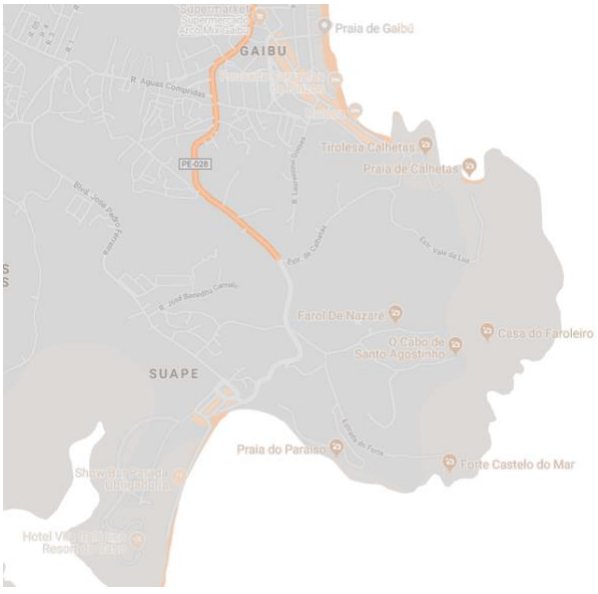


Figure 2. By Google. (n.d.) Vila de Nazaré, Cabo de Santo Agostinho, Pernambuco.

On the southern side of the Vila de Nazaré peninsula are the ruins of the Castle of the Sea Fort (*Forte Castelo do Mar*), built in 1630 by the Portuguese to protect the port of Nazaré and the estuaries of the Ipojuca and Massangana rivers from Spanish, English and Dutch invaders (Instituto Brasileiro de Geografia e Estatística [IBGE], 2016). Today, the remaining walls of the fort are covered in graffiti and serve as a reminder of the geopolitical significance of this

location for the Portuguese at one point in time. Facing south of *Forte Castelo do Mar* is the relatively modern international Suape Port, which has become one of Brazil's most important ports since it began its operations in 1992 (Complexo Industrial Portuário de Suape, 2016). Although the port has created thousands of jobs, the expansion of the port has displaced hundreds of people and altered the natural environment (Cabral, 2011). Several locals of Vila de Nazaré that I spoke with told me the construction of the port has destroyed hundreds of acres of mangroves, caused an increase of shark attacks, and altered the way of life of the local fisherman. The construction of the Port of Suape and its effects on people can be viewed through the lens of political ecology, or the theory that a consequential relationship exists between political, economic, social factors and the regional environment (Robbins, 2012). A study on the biological effects of the port's construction indicate a significant reduction of marine life, reefs, and mangroves as a result of increased boat traffic and subsequent pollution (Cordeiro, et al., 2019). The construction of the port also led to forced evictions of locals, displaced fishermen of their livelihood, and increased crime (Sullivan, 2014). In Vila de Nazaré I was introduced to an aspect of the Northeast's unique political ecology, which as I discovered through my research, has implications on public policy and public health outcomes.

Public Health Policy

I became interested in public health policy and its impact on people when I worked for an NGO that serves as a health care provider and advocates for reproductive health care rights in the United States. According to the World Health Organization (WHO), "health policy refers to decisions, plans, and actions that are undertaken to achieve specific health care goals within a society" (WHO, 2019a). After the rollout and implementation of the Patient Protection and Affordable Care Act[1] (ACA) in 2014, I worked as a Latino outreach organizer for Planned

[1] Patient Protection and Affordable Care Act, enacted March 23, 2010, Accessed at http://legcounsel.house.gov/Comps/PPAACA_BEL.pdf

Parenthood in Tucson, Arizona. The ACA was signed into law on March 23, 2010 by U.S. President Barack Obama with the objective of expanding access to affordable healthcare to uninsured Americans (Koh and Sebelius, 2010). As a result of this policy, 20 million Americans have gained access to health insurance since its implementation (Bakalar, 2017). One of the provisions of the law requires most insurance providers to cover contraception methods and other preventive health care services (Koh and Sebelius, 2010), so my responsibilities as an organizer were to educate people on their rights and help them enroll for insurance. Many of the people I helped were enrolling for health care for the first time in their lives! Through my work with this organization, I became aware of the importance of reproductive health care access, particularly for marginalized communities such as women, minorities, and low-income people. I also became aware of the direct impact that public policy can have on access to health care services. In other words, I witnessed how politics can directly affect a person's health and wellbeing. This research aims to expose the effect of politics on public health policy in the Brazilian context. The Northeast of Brazil provides an ideal location for this research due to the policy shifts that emerged during the Zika epidemic and concurrent political and economic crisis.

Background

The Zika virus is an arbovirus (arthropod borne) transmitted by the common *Aedes aegypti* mosquito and via sexual activity with an infected person (Musso, et al., 2016). Eighty percent of people infected by the virus show minimal or no clinical symptoms, which range from fever, conjunctivitis, rashes, muscle pain, and headaches. These symptoms are also common to other flaviviruses like dengue, yellow fever, and chikungunya, which are abundant in tropical regions (Basarab, et al., 2016). There is a strong correlation between the Zika virus causing congenital birth defects, such as microcephaly, characterized by an abnormally small brain (Schuler-Faccini, 2016). While the exact arrival of the Zika virus is difficult to pinpoint in Brazil, cases of the disease began to be reported as

early as December 2014 (Diniz, 2016). As a result of the proliferation of the Zika epidemic and increase of reported cases of microcephaly, Brazil's Ministry of Health (*Ministério de Saúde* [MS]) declared a public health emergency in November 2015 (Lowe, et al., 2018), and by February 2016, the Zika epidemic was categorized by WHO as a Public Health Emergency of International Concern (Nebehay and Hirschler, 2016). A disproportionate number of Zika and microcephaly cases were reported in Brazil's Northeast region, particularly in Recife, the densely populated urban capital of Pernambuco (Souza, et al., 2018). The Northeast has a history of epidemics, such as yellow fever, dengue, and chikungunya (McNeill, 2010; Cavalcanti, et al., 2015; Nunes, et al., 2015). Research shows that people living in unsanitary living conditions combined with the tropics are more susceptible to disease (Souza, et al., 2017). In fact, several ecological studies indicate that Northeast is largely underdeveloped, characterized by poor infrastructure (Garmany, 2011), lack of adequate sewage sanitation and trash collection (Stepping, 2016), and irregular water supply (Caprara, et al., 2009). Consequently, people who are low-income and live in these conditions are more susceptible to disease. As indicated by a report by Human Rights Watch [HRW], the Zika epidemic "disproportionately impacted women and girls and aggravated longstanding human rights problems, including inadequate access to water and sanitation, racial and socioeconomic health disparities, and restrictions on sexual and reproductive rights" (2017, p. 2).This research will expand on the gendered, racial, and economic effects of the Zika epidemic, in tandem with an economic recession and political instability and the role of the State in dealing with the public health crisis.

In 2016, Brazil was experiencing a historic economic and political crisis (Ghitis, 2016). The Zika epidemic unearthed the connection between politics, public health policies, and the environment. While all these problems were unfolding, Brazil was about to host the Olympics, which was surrounded by controversy due to the remarkable amount of public funds spent on the game's infrastructure (Phillips, 2016). Dilma Rousseff, barely winning re-election, initiated a

campaign to eradicate the vector that focused primarily on the extermination of the mosquito (Gómez, et al., 2018). A stagnant economy, a government mired in corruption scandals, and the fallout of the Zika epidemic ultimately led to a well-crafted impeachment of Dilma Rousseff by her opposition on August 31, 2016 (Romero, 2016). Michel Temer, of the center-right Brazilian Democratic Movement Party (*Partido do Movimento Democrático Brasileiro* [PMDB]) ascended to the presidency immediately prompting policy changes (Sims, 2016) that reverberated across different fields. During this political transition, the Zika epidemic was at its peak, so the policy changes subsequent to Rousseff's ouster hampered and/or ceased efforts to address the public health crisis taking place in the Northeast. There are several important elements that fueled the Zika epidemic: first, the lack of comprehensive health care and a public health care system unprepared to address epidemics; second, poor infrastructure and inadequate sanitation systems; third, national political and economic instability; and lastly, the wet and tropical environment of the Northeast's Atlantic Forest. In other words, the political ecology of the Northeast was conducive to the Zika epidemic and subsequent public health crisis. Even though significant efforts were made during the PT administration to improve health care and infrastructure (Phillips, 2010), the Zika epidemic exposed the diminishing continuity of government policies in between administrations and its inability to respond to a public health crisis.

The aim of this research is to examine the implications of the Northeast's political ecology on different segments of society. One way to define political ecology is the relationship between a region's environment with political, economic, and social factors (Robbins, 2010). In regard to the Zika epidemic in the Northeast and public health policy, the political ecology of the region reflects a pattern of economic negligence and political inconsistencies that often have disproportionate effect on people along racial, socioeconomic, and gendered lines. The concept of political ecology serves as

a theoretical framework for this research and helps explain the factors that are conducive to disease epidemics and their impact on different populations. The central questions behind this research are:

Research Questions

> How did the shift in national politics in 2016 affect public health policy in Northeastern Brazil during and after the Zika epidemic? How were organizations dealing with the Zika virus impacted by the policy shifts between the Rousseff administration and the Temer administration? And more importantly, how did these policy shifts affect people?

Overview

This research will be structured in the following manner: Chapter One will provide a summary, including the methods and findings. I will also provide a description of the city of Recife as a research site and a brief historical context of Brazil and the Northeast. Chapter Two will lay out the theoretical framework of this research. I will expand not only on the theory of political ecology, but also on notions of State strength, which refers to the measurement of a State's strength contingent of several factors, including but not limited to, democratic consolidation, proportional economic wealth, and the provision of basic services (i.e. education, health, infrastructure) (Giraudy, 2012). Chapter Three will discuss the role of government and NGOs during and after the Zika epidemic. It will also discuss the impact that the abrupt political transition between Rousseff and Temer had on organizations and their functional capacity. Chapter Four depicts the consequences of the crises on people. It will contrast the experiences of two women that differ in class and race. Chapter Five will expand on the findings of this research and conclude with a discussion of the current political context in Brazil, its strength as a State, and subsequent policy implications.

Methods

The city of Recife, capital of the Northeastern state of Pernambuco in Brazil served as this project's research site between June and July 2017, which falls in the middle of the region's rainy

season. A qualitative research approach was applied to collect data, which seeks to understand a phenomenon by going directly to the people involved and provides the opportunity to understand a problem through direct experience (Rubin and Rubin, 2011). We can construct meaning by interpreting and analyzing our interactions with people and the environment using a conceptual framework, or a theoretical lens that gives meaning to a social reality (Jabareen, 2009; Preissle, 2006). This research applied several qualitative research methods to collect data. First, majority of the data was collected through eight semi-structured, personal interviews, and one group interview consisting of five people. According to Longhurst, "semi structured interviews unfold in a conversational manner and offer participants the chance to explore issues they feel are important" (2003, p. 103). Thus, semi-structured interviews create the space to explore participant attitudes and beliefs through a conversation. The conversations I had with many people in Recife covered sensitive topics, but most people interviewed were eager to speak about the socioeconomic, political, and environmental issues that afflict the Northeast.

In addition to semi-structured interviews, I also had informal conversations with doctors, nurses, volunteers, students, activists and civilians throughout the research process. I met these individuals through research participants and through my interactions within the city of Recife. Informal interviews are characterized by, "a total lack of structure or control" (Bernard, 2017, p. 211). Sometimes people just want to talk, and in Brazil there was a lot going on. Research participants were recruited through chain referral, also known as the snowball sampling method of recruitment. This method is practical for "hard to find or hard to study populations" (Bernard, 2017, p. 192). Given the contentious nature of my research topic (i.e. reproductive health care, politics, Zika, environmental issues), the snowball sampling method was useful in finding suitable research participants. During my time in Vila de Nazaré, I met Dr. Castro through the people I was staying with. We scheduled an interview for the following week, and my research took off from there. As I

discovered in Recife, there is a close-knit network of health care providers, researchers, and advocates revolved around Zika that connected me to other potential interviewees. For instance, Dr. Castro connected me to other participants working in health care and research, through Ana I met the group of researchers, and Dr. Valdes connected me with a mother whose child was being treated for microcephaly. In addition to chain referral, purposive sampling, defined as the selection of samples based on specific characteristics pertinent to the objective of the study (Crossman, 2018) was applicable to this research. Participants were selected based on their connection with the Zika epidemic, health care policy, and education/research. Unstructured observations of research sites complement the data. Detailed field notes were written daily to record observations and photographs were taken to document location sites. All semi-structured interviews were audio recorded and transcribed. An Institutional Review Board at the University of Arizona reviewed and approved this research.

Sample

Research data was collected from eight individual interviews, and one group interview consisting of five people, totaling 13 total research informants. My intent was to interview people who were personally affected by the virus, but the focus shifted to people and organizations that responded to the epidemic and/or work in the realm of public health policy because these organizations had to respond to both policy changes and the Zika epidemic. The names of informants have been changed to protect identity. Before going to Recife, I contacted Pam Belluck, a journalist for the New York Times who covered extensively the Zika epidemic in the Northeast. To my surprise, I got a response from Belluck referring me to Dr. Valdes of the Altino Ventura Foundation (*Fundação Altino Ventura* [FAV]) and a representative of UNICEF. An interview with the latter did not materialize, but I did interview Dr. Valdes and Dr. Gutierres of FAV. Immediately after my interview with Dr. Valdes, I met Andrea, whose child was diagnosed with microcephaly. I

also contacted Ana of Gestos before arriving in Brazil. I met her in person at a conference[2] Ana invited me to, where we scheduled a time to meet. Ana also invited me to a research presentation on the impact of the Zika virus on reproductive intentions (Marteleto, et al., 2017) where a group interview with other researchers and doctors materialized. I met Dr. Castro, the first informant I interviewed, in Vila de Nazaré. After our interview at the Professor Fernando Figueira Institute of Integrated Medicine hospital (*Instituto de Medicina Integral Profesor Fernando Figueira* [IMIP]), , Dr. Castro gave me contact information for Dr. Paes, a medical doctor, professor, and researcher, who I interviewed at the Federal University of Pernambuco (*Universidade Federal de Pernambuco,* [UFPE]). The interview with Brenda took place in her apartment, where I was lodging during my time in Recife. Most informants referred me to other people, but I was unable to coordinate meetings due to time constraints.

Findings

The Northeast of Brazil reflects a history of economic neglect and political instability that disregards investments in infrastructure, public health, and education. When you factor the environment of the region[3], the ideal conditions for disease epidemics are created. These factors led to the proliferation of the Zika epidemic, which affected Brazilians along socioeconomic, racial, and gender lines. Brazilians who could avoid the environmental conditions where the *Aedes aegypti* mosquito thrives, such as areas near open water, minimized their exposure to the virus. Conversely, impoverished Brazilians who lived proximate to these conditions were more prone to disease. The political and economic crises of 2016 affected most Brazilians, as unemployment and interest rates were high (Kiernan, 2015). The political transition that occurred amidst an economic recession and a

[2] *"Seminário de Apresentação do Relatório Luz da Sociedade Civil sobre Implementação dos Objetivos de Desenvolvimento Sustentável no Brasil"* (July 7, 2017) Casa Forte, Recife.

[3] The Northeast consists of four diverse sub regions. Throughout this research, I will refer to the Northeast specifically referring to the tropical, humid region of the forest zone, located along the far eastern coast along the Atlantic Ocean.

public health crisis triggered a wave of policy changes that affected organizations and civilians alike. Government and nongovernmental organizations were faced with steep budget cuts that limited their organizational capacity and the services they could provide

The Zika epidemic and the concurrent political and economic crisis had a socioeconomic, racial, and gendered effect. Put another way, the epidemic disproportionately affected low income, dark skinned women (Castro, 2018; Diniz, et al., 2017; Diniz, et al., 2012; HRW, 2017; Souza, et al., 2018). Research studies and media reports indicate that skin color continues to be a determining factor of socioeconomic inequality in Brazil (Block, 2013; Hamilton, 2001; Telles, 2004). According to Moraes Silva and Paixão from the Project on Ethnicity and Race in Latin America, "Brazilian racial categories have been largely understood as skin color categories rather than ethnic or cultural categories" (2014, p.175). They also note that "discrimination and prejudice in Brazil is not about race, but rather about phenotype" (Moraes Silva and Paixão, 2014, p. 180). Phenotype refers to the observable physical characteristic of an individual that are determined by genetics (Crawford, et al., 2017). While the measurement of skin pigmentation helps us define what it means to be Black in Brazil, racial identity and categorization is not exclusively about skin color and requires further examination. In this context, I will refer to non-white, Afro-descendant Brazilians as individuals with a darker skin pigmentation.

The Brazilian State's strength comes into doubt, as it largely failed to provide basic health care services, infrastructure, and education to prevent disease epidemics. Government and NGOs were forced to seek for funding from international funding to continue their services, stirring the idea of the hollow state, which refers to the substitution of the government and the services they should provide by domestic and foreign nongovernmental organizations. So, while the demand for health care increased, funding for healthcare declined and NGOs assumed the role of government. Given the current political context in Brazil, an economy still in recovery, combined with a changing

environment and warming climate, the implications of this research may be relevant when developing public policies aimed at minimizing socioeconomic, racial, and gender inequalities. This research will expand on these findings.

O Nordeste | The Northeast

Brazil is divided into five regions: North, Northeast, Central West, Southeast and the South. Due to the region's climatic and environmental variations, the Northeast can be divided into four sub regions (See Appendix A). Along the far east coast, is the forest zone (*zona da mata*) known for its tropical climate (Hance, 2010). The semi-arid *agreste* and arid *sertão* regions are much drier and experience severe droughts (Azevedo, et al. 2018). The *meio-norte* with its proximity to the Equator and Amazon forest, is characterized by year-round precipitation and mild temperatures (Oliveira, et al., 2017). Several factors led me to select Recife, the urban capital of the Northeastern state of Pernambuco, as the principal site for this research. To begin, the Northeast, specifically the *zona da mata* subregion, had a concentration of Zika and microcephaly cases unlike any other region of Brazil (See Appendix C; Lowe, et al., 2018). In fact, the city of Recife was considered to be the epicenter of the virus due to the high rate of microcephaly cases reported in 2015 (Lopes and Miroff, 2017). This is a result of a number of issues pertinent to the city and the region. First, the Northeast of Brazil is considered the poorest region in the country. Of the 16 million Brazilians that live in poverty, more than half reside in this region (Catching up in a hurry, 2011). While the Northeast was the center of political and economic power during its colonial period, its monoculture-based economy left the region disregarded when the country's Southern cities of São Paulo and Rio de Janeiro began to experience massive industrialization in the 20th century. Between 1532-1700, during the peak of colonialism, Salvador in the Northeast state of Bahia, was the capital of Brazil given its sugar economy and its geopolitical location (James and Faissol, 1956). When

diamonds and gold were discovered in the southern state of Minas Gerais towards the end of the 17th century, a massive migration of people and wealth transferred from the Northeast to the south and Rio de Janeiro became the capital of Brazil (James and Faissol, 1956). While the southern cities of Rio de Janeiro and São Paulo experienced a period of industrialization beginning in the 18th century, as a result of the mining and the coffee industry respectively, the Northeast was largely left underdeveloped (James and Faissol, 1956; Goldsmith and Wilson, 1991). After centuries of being deprived of investment and economic development, the Northeast inherited a disintegrating infrastructure, high poverty rates, and poor education and public health outcomes (Goldsmith and Wilson, 1991).

Throughout the 1960s, economic and social welfare programs were implemented to revitalize the Northeast, but the region still lags behind its counterparts in the south in economic, health, and education indicators. Furthermore, the *zona da mata* sub region's climate and environment created the perfect conditions for the proliferation of mosquitos and the viruses they carry. Recife, due to its proximity to the Atlantic Ocean, the fluvial systems that cut through the city, and the area's intense rainy seasons, make the city particularly vulnerable to mosquitos, especially the city's poorest inhabitants who tend to live in favelas along the city's rivers. Lastly, the infrastructure and basic services provided by the government were inadequate to handle the needs of its growing population and its environment. The lack of basic services, such as access to potable water and proper sanitation systems, and a relatively weak public health system created the perfect conditions for the proliferation of the mosquito and thus, the proliferation of the Zika virus. As stated by Telles, "with industrialization comes the profound restructuring of labor market positions and the potential of unprecedented opportunities subordinate racial groups" (1994, p. 46). The industrialization of the South essentially made the Northeast subordinate, given the region's history of slavery and subsequent racial composition. Since the abolition of slavery, popular discourse on

race has prided itself in being an inclusive, non-discriminatory society. The idea of a "racial democracy" was coined by Brazilian anthropologist, Gilberto Freyre, where he advanced the notion of Brazilian identity as the harmonious synthesis of European, Afro and Indigenous ethnicities (Freyre, 1956). Many critics disagree with Freyre's interpretation of Brazilian society and see racial discrimination as alive and well in contemporary Brazil. Following the emancipation of slaves at the end of the 19th century, racial discrimination was replaced by class discrimination; in fact, socioeconomic policies that were enacted subsequent to the end of slavery hampered the social mobility of recently freed slaves, especially in the Northeast with its large population of Afro descendants. Thus, a history of inequality compounded the effects of the Zika epidemic in the Northeast, and perpetuated the region's socioeconomic, racial, and gender inequalities.

Historical Context

A critical look into the nation's history is essential in providing a framework of the Northeast's current social, political and economic situation. As most countries in Latin America, Brazil has a complex history of development that dates back to its first inhabitants, the indigenous peoples of the inland and coastal regions of Brazil. In 1500, Pedro Álvares Cabral of Portugal docked somewhere along the Northeastern coast, and thus began a period of colonialization showed by heavy exploitation of Brazil's natural resources (Burns, 1993). In addition to brazil wood, Portugal began to produce and export sugar, establishing a labor-intensive plantation system centered in the Northeast of Brazil. The region's environment began to be completely transformed, characterized by massive deforestation, soil erosion, and contamination of the Northeast's river systems. As McNeill relates, ecological change resulting from the establishment of a plantation economy created the ideal conditions for mosquitos to breed, helping them become key actors in the geopolitical struggles of the early modern Atlantic world (McNeill, 2010). Such was the case in the Northeast where the indigenous population was nearly decimated as a result of yellow fever and

malaria outbreaks, which were brought by the European colonizers and were transmissible not only through exposure to an infected person, but also through a mosquito bite (McNeill, 2010). Consequently, the Portuguese began to bring slaves from Africa in order to meet hard labor demands for extracting natural resources and working the sugar plantations. In fact, between 1500 to 1800, the Portuguese brought nearly 2.5 million African slaves, many of whom were forced to work in the lucrative *engenhos*, or sugar plantations, concentrated in the Northeastern region of Brazil (Rogers, 2010).

Colonialism in the Northeast had several consequences. First, the labor-intensive mineral extraction and plantation systems, which depended on slavery, effectively established a racial hierarchal system in Brazil. Secondly, the Catholic Church interwove itself into many aspects of Brazilian life. In addition to converting the Indians and African slaves into Christianity, the Church obligated them to speak the Portuguese language and abandon all previous customs and knowledge. Third, the colonial period in Brazil established a powerful patriarchal system. The monarchs granted the Portuguese settlers (primarily males of European descent) large *fazendas* in order to facilitate the occupation of Brazil and placed many of them in positions of captaincies in order to help govern the territory (Burns, 1993). Lastly, colonialism created a capitalist economy that encouraged the transformation of the environment to extract its resources, largely through the labor of slaves. Given the Northeast's geopolitical location and lucrative plantation economy, it served as the center of political and economic power throughout Brazil's colonial period. However, by the turn of the 19th century, much of its influence began to shift south to the emerging cities of Rio de Janeiro and São Paulo.

Post-Colonialism in the Northeast

Unlike the Spanish colonies, in 1822 Brazil gained its independence from Portugal with relatively little violence as a result of the monarchy's alignment of interests with the country's elite.

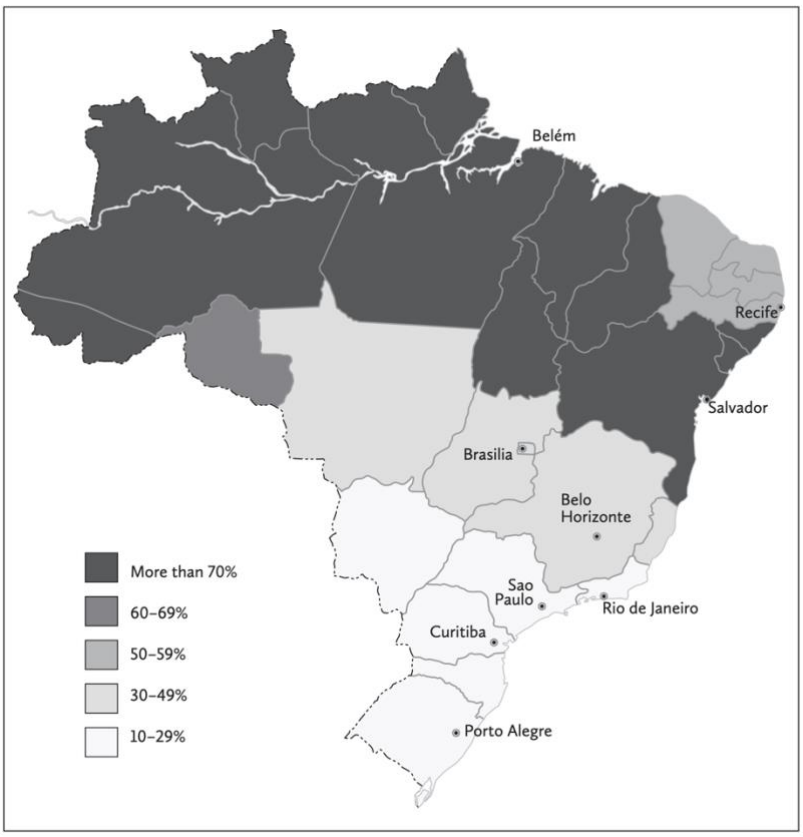


Figure 3. By Moraes Silva and Paixão. (2014) Percent Black or Brown in Brazil, by State. Source: Census of Brazil, 2010.

The Empire of Brazil, which continued to be governed by the royal family of Portugal, was afflicted by internal and external conflicts, mainly the abolishment of slavery in 1888, that ultimately led to the empire's demise at the dawn of the 20th century (Burns, 1993). The worldwide depreciation of sugar prices in the late 1800s, complemented by the abolition of slavery crumbled the plantation economy of the Northeast (Rogers, 2010). Despite the end of slavery, the economic and political hierarchy remained in place. Former slaves continued to work in the *engenhos* as *moradores* in exchange for a miniscule wage and a place to live. Following the end of slavery, social and economic policies prevented many freed slaves to own property and hampered their ability for social mobility. The government also created policies that promoted European immigration to first, take up jobs in the industrialized southern cities of São Paulo and Rio de Janeiro, and secondly, to whiten Brazilian society with the idea of reflecting progress (Telles, 2014). These socioeconomic policies created a racial composition of the country that is still visible, as seen in Figure 3. These policies also deprived the Northeast of economic development and industrialization, and exacerbated the regional and racial inequalities of the country.

Authoritarianism

Brazil's transition into the 20th century was marked by political and economic instability. The combination of civil unrest due to labor strikes and the world economic crisis resulting from the Great Depression facilitated a military coup in 1930 that put in power Getúlio Vargas (Burns, 1993). Dubbed the *Estado Nôvo*, his dictatorship lasted until 1945, when the military essentially forced him out of office. Within that time, Vargas centralized the federal government, diversified the agricultural sector, and stimulated industrialization of Brazil's economy through import-substitution (Bethell, 2008). This was viewed by many as saving the region's economy and introduced modern technologies to the struggling industry. Particular to the Northeast and its sugar economy, Vargas created the *Instituto do Açúcar e do Álcool* (IAA), which modernized sugar's production method in response to the toll the industry was having on the environment. According to U.S. ecologist Frederic Clements, sugar production at that time burned through at least fifty-hundred hectares of forest every year in the Northeastern state of Pernambuco alone (Rogers, 2010).

By 1954, a military-led investigation revealed Getúlio Vargas' connection with the assassination of a political rival and provoked his own suicide, which led to further political instability. Following the death of Vargas, a transitory democracy prevailed until a military regime fully took control of Brazil in 1964 though a coup d'état that removed President João Goulart from office (Bethell, 2008). The country was governed by an authoritarian regime for over twenty years, during which civil liberties were essentially abolished and political dissidents forcibly silenced. Military rulers also implemented neoliberal economic policies in order to encourage foreign investment and promote economic growth. In fact, a set of legislative initiatives in the 1970s triggered a sugarcane boom, characterized by the modernization of the agro-industry and increased use of fertilizers (Rogers, 2010, p.180-181). Ultimately, the authoritarian military regime was unable to maintain economic control; power transitioned back to civil hands through an electoral college

that elected Tancredo Neves as president in 1985. The political processes that follow set the stage for Brazil's contemporary political framework.

While the Northeast experienced some economic improvements under military rule due to the modernization of its agroindustry, these reforms where unsustainable, both financially and environmentally. According to Rogers, the boom increased cane acreage and production levels through impressive escalations in fertilizer use, varietal engineering, and funding, but it also increased the destruction of the native forest and the pollution and siltation of rivers and streams (2010, p. 84). Deforestation and the pollution of rivers had several effects. First, the destruction of native forests left the Northeast vulnerable to floods, and subsequent stagnant waters. Additionally, the contamination of the Northeast's intricate fluvial systems, not only eradicated many fish populations, but also exposed populations to contaminants and diseases. As previously stated, the humid and moist conditions of the environment produce the ideal conditions for the feeding and breeding of mosquitos, which ultimately lead to the proliferation of mosquito-borne viruses, such as the Zika.

Neoliberalism in Brazil

Brazil's transition into the 21st century was precarious, given its nascent democracy and its exposure to the Latin America debt crisis of the 1980s. Jose Sarney became president and governed from 1985 to 1990. One of his administration's most memorable achievement was overseeing the ratification of Brazil's new Constitution in 1988 (Bethell, 2008). Conversely, Sarney's economic policies thrust Brazil into an economic depression plagued by hyperinflation and meager economic growth. His successor, Fernando Collor de Mello, was the first democratically elected president in 29 years, although his presidency was short lived. Collor had a trail of corruption scandals that led to his impeachment in 1992. Subsequently, Vice President Vitamar Franco was placed into power and implemented the *Plano Real* which brought inflation under control through neoliberal economic

policies (Bethell, 2008). For example, Franco prompted a pattern of privatization of previously owned state enterprises. The succeeding president, Fernando Henrique Cardoso, continued these policies that fed the increasing stratification of Brazilian society, especially in the Northeast. Nonetheless, a popular Cardoso was re-elected to a second term in 1998, as the economy had relatively improved under his administration.

While Brazil was able to stabilize its economy and attract capital inflow with Cardoso's *Plan Real*, neoliberal economic policies exacerbated income inequality and had a relatively small effect on the economy's overall strength. According to Amman and Bear, the average yearly growth rate in the 1990s was 1.82%, which was lower than the average growth rate in the so-called 'lost decade' of the 1980s which stood at 3.03% (Amann and Baer, 2002). Brazil's industrial sector was relatively weak, as many of the fiscal policies implemented forced many industries to cut labor. Moreover, the neoliberal policies stopped the government from investing in public programs such as public health, education, and infrastructure. This had the effect of increasing the gap between rich and poor, which was already high. The policies implemented during the 1990s worsened the equity of income distribution. Research shows that Brazil has one of the highest levels of income inequality in the world; data also shows that regional income inequality remains high (Skidmore, 2004). Given the region's socioeconomic conditions, income inequality tends to have a disproportionate effect on the Northeast.

Even though the country's economy was stabilized during the Cardoso administration, the poverty rate remained high. The lack of employment opportunities in Brazil's industrial sector resulted in an increase of inequality in the country, which can be attributed to the privatization of many of Brazil's industries and the development of new technologies that replaced workers in these industries. To date, neoliberal policies have not led to growth in equity. This is especially the case in Northeastern Brazil. Access to sanitation, education and healthcare became extremely limited, and

cuts to public programs and the increase of income distribution have led to an increase of urban violence (Skidmore, 2004) These conditions have contributed to the persistent outbreak of multiple mosquito borne diseases such as dengue, chikungunya, and Zika in areas like the Northeast where the issue of poverty, sanitation and the environment converge.

Leftist Populism

Swelling income inequality, endemic poverty, and popular unrest gave rise to Brazil's first leftist party, the Workers Party (*Partido dos Trabalhadores* [PT]) through the election of Luis Inácio "Lula" da Silva in 2002. As Bethell indicates, expectations were very high for Lula as he was expected to maintain economic stability and stimulate economic growth, while lifting the country's most impoverished out of poverty, extending citizen's rights, and promoting social justice (2008). Lula is considered one of Brazil's most popular presidents due to his social programs and monetary policies that led to the country's overall economic growth amidst a global recession. Among the most successful socioeconomic programs is the *Bolsa Família,* which functions as a conditional monthly money transfer program that began in 2003 (Soares, et al., 2010). This program had a positive impact on adult labor force participation, as a result of the conditions established under the program, such as keeping children in school and ensuring regular preventive medical care service visits. In fact, ten years after the program was implemented, 14 million households benefit from the program; moreover, extreme poverty levels dropped from 9.7% to 4.3%, and income inequality declined by 15% (Wetzel, 2013). Additionally, the impact of the program has been greater among women, particularly in the Northeast, Brazil's poorest region (Soares, et al., 2010). Lula's first term in office can be interpreted as a continuation of his predecessor's neoliberal economic policies. Even though his campaign verbalized radically changing the status quo, his economic policies embodied, as stated by Williamson, the original concept of the Washington Consensus – macroeconomic discipline, the market economy, and opening up the economy to foreign trade (Williamson, 2003).

Lula's main goal was to stabilize the economy and attract foreign investment, while stimulating domestic production and promoting social welfare programs, a delicate task.

Lula was largely successful in promoting his social and economic policies, but not without setbacks. The *mensalão* (monthly payments) corruption scandal emerged in 2005, which implicated many high-ranking politicians of the PT in a widespread bribery scheme to secure legislative support in Congress from 2004 to early 2005 (Power and Taylor, 2011). Despite corruption allegations, Lula handedly won reelection in 2006. The following year, Brazil won coveted bids to host the 2014 FIFA World Cup and the 2016 Olympics that thrust the country on the global stage. Lula's chosen successor, Dilma Rousseff, took office in 2010 benefiting from the previous administration's economic successes and political popularity. Dilma Rousseff, Brazil's first female president, inherited a complex state of affairs. As a result of the commitments Lula's administration made, her administration was tasked with guaranteeing the country's necessary infrastructure for hosting these large-scale, global events. Her popularity began to decline towards her re-election in 2014 due to stagnant economic growth. The combination of Brazil's dormant economy, Rousseff's growing unpopularity, and the rise of Brazil's right-wing party led to her constitutionally backed impeachment in August 2016. Important to mention was the PT's and other political party's involvement in the *Lava Jato* and *Petrobras* corruption scandal, massive expenditures on the FIFA World Cup and Olympics, and civil unrest due to these discrepancies gave Brazil's right-wing lawmakers political ammo to proceed with Rousseff's impeachment proceedings. The implications of this political crisis will be discussed in the next chapter.

The Zika Epidemic

The Zika virus, in addition to being transmitted via mosquito bite, is also transmitted via sexual activity with an infected person and is linked with causing congenital side effects, such as

microcephaly, in newborns whose mother was infected with the virus during the gestation period (WHO, 2018b). In February of 2016, the World Health Organization declared the Zika epidemic a global health emergency as a result of its rapid spread throughout Brazil (Tavernise and McNeill, 2016). Particularly affected by the virus was Brazil's Northeastern region, as evidenced by the concentration of microcephaly cases in the region (Appendix C; Lowe, et al., 2018). Several factors contributed to the rapid growth of the Zika epidemic in the *zona da mata* region of the Northeast; first, the region's climate and environment; secondly, the lack of basic services, such as access to potable water and proper sanitation systems; and lastly, an unprepared public health system created the perfect conditions for the proliferation of the mosquito and thus, the proliferation of the Zika virus.

The first factor that may have contributed to the proliferation of the Zika was the Northeast's climate and environment. Brazil's humid, wet environment, especially during the rainy season, creates the perfect environment for mosquitos to reproduce. A study suggests that the high temperatures associated with *El Niño* during 2015 accelerated the mosquito's reproductive and maturation cycles, quickly increasing the vector's population (Cyril, et al., 2016). The threat of climate change and its projected rise of temperatures may further increase the proliferation of arboviruses. Additionally, centuries of transformation of the environment through deforestation and soil erosion may have further intensified these conditions. The region's extreme wet and dry seasons also have caused a large increase of rain fall and subsequent flooding, as well as severe drought in the region's interior, and may consequently escalate the spread of arboviruses like dengue and Zika (Matysiak and Roess, 2017).

The second factor that contributed to Zika's epidemic in the Northeast is its poor sanitation systems and lack of or access to potable water. According to a WHO report, "more than one-third of Brazil's 208 million people do not have access to a continuous water supply, while 3.8 million lack

any access to safe drinking water" (2016). These conditions force Brazilians, primarily those living in poverty, to store water in containers such as tanks or buckets, exposing them to mosquitos to breed. A lack of proper garbage collection services may have also contributed to the spread of mosquitos, as these vectors are prone to laying eggs in any environment where there is moisture and stagnant water. In fact, approximately only half of the population had access to proper garbage collection services (Ministério das Cidades, 2015, p. 78). Furthermore, more than 35 million people in Brazil lack proper sanitation services, such as the disposal of human waste (WHO and UN Water, 2016). In regard to the country's Northeast, specifically in the city of Recife, which was considered the epicenter of the Zika epidemic, favelas are aligned the Capibaribe river and other of the city's waterways, exposing these populations not only to Zika, but other diseases as well. These conditions can be attributed to decades of under-investment of the region's infrastructure due in part to neoliberal economic policies and government corruption.

Lastly, a relatively strained and unprepared public health system intensified the proliferation of the epidemic, which has primarily affected Brazil's already marginalized populations. According to Brazil's Ministry of Health, more than three quarters of reported microcephaly cases were concentrated in the state of Pernambuco in the Northeastern (See Appendix D; COES, 2016). Further studies also indicate that the Zika epidemic primarily affected dark skinned women. Indeed, 83% of microcephaly cases reported to Brazil's Ministry of Health (MS), were from non-white women (Castro, 2018). Brazil's public health system was unable to identify the virus, much less provide remedies to infected persons. Given the fact that Zika was also spread through sexual activity, Brazil's public health system did not advocate for reproductive health measures to remedy the situation. Instead, the Ministry of Health focused on vector control via massive fumigation plans throughout urban centers in Brazil, disregarding the reproductive health aspect and the root cause of epidemics, the region's inadequate infrastructure.

The Zika epidemic was a symptom of the Northeast's tropical environment converging with the region's political, economic, and historical context. The region's humid forest zone complemented with an increase of temperatures create the perfect conditions for mosquitos to procreate. These conditions are, in part, a result of massive environmental transformations as a result of the region's colonial, agro-economic history. The lack of basic services, such as access to potable water and proper sanitation systems, as a result of Brazil's political and economic policies that tend to disregard investment in infrastructure and public health in the impoverished Northeast exacerbated the proliferation of the Zika epidemic in the region. Consequently, a frail public health system unprepared to address the epidemic, much less prevent it, created the perfect conditions for the proliferation of the mosquito and thus, the proliferation of the Zika virus. Given the Northeast's unique socioeconomic history, characterized by centuries of bondage and subsequent lack of economic development, the Zika epidemic had a disproportionate effect on impoverished young women of color (Castro, 2018; Diniz, et al., 2017; Diniz, et al., 2012; HRW, 2017; Souza, et al., 2018). These social, political, and economic interactions with the environment, especially in regard to access and control of natural resources and land were conducive to the outbreak of the Zika virus in Northeastern Brazil. In the next chapter, I will provide a theoretical framework that will provide a political ecology lens to view, interpret, and understand the different elements that were led to the public health crisis.

Figure 4. By E. Camarena. (2017) Trash collected on the banks of the Capibaribe River.

CHAPTER TWO | Political Ecology of the Northeast

In the previous chapter, I introduced the central questions of my research and provided a summation of the political, economic, and social factors that were conducive to the Zika epidemic in 2015. This chapter will provide a theoretical framework to understand the Brazilian context that led to the epidemic and its implications on different segments of society. This research is founded primarily on the theory of political ecology, which posits a consequential relationship between a region's environment and its political, social, and economic conditions (Robbins, 2011). I will incorporate concepts on strong versus weak States, which describes the conditions that separate a strong and weak state, in the Brazilian context, the continuity of public policies and its ability to deliver public goods.

Brazil's precarious political situation, paired with a tightening economy and a constantly changing environment ultimately created the perfect conditions for the Zika epidemic to flourish, particularly in the Northeast, the region most afflicted by the virus. Given the political, economic, and environmental circumstances that led to the outbreak, a political ecology framework is useful in understanding the scope of this situation. The theoretical footings of political ecology include a wide-range of interrelated issues (Robbins, 2011, p.14), but can be understood as the intricate relationship between the natural environment and the political economy, and the consequences on society thereof. The term environment embodies a myriad of issues ranging from environmental

degradation, climate change, and access to resources. In anthropology, political economy refers to the influence of economic systems on social relationships, specifically on the organization of power (Warms, 2013, p. 631). As explained by Blaikie and Brookfield, political ecology "combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (1987, p. 17). Their research analyzes the relationship between land degradation and sociopolitical issues using several case studies that demonstrate that the history of development and regional political systems are key determinants of the beneficiaries and victims of environmental change. Furthermore, their work illustrates a common theme that the historical, political, and economic context of a region influence the conflicts between society and the environment, hence political ecology. When you combine the Northeast's history of political and economic neglect, reflected by a lack of development and investments in infrastructure, with the region's natural environment, a situation abundant in disease and negative health outcomes is exacerbated (See Figure 4).

While my own research doesn't focus on conflicts over land-based resources, it certainly highlights the consequences of an inequitable political economy, a constantly changing environment, and the subsequent spillover effects on different segments of society. I will be analyzing the effects on individuals at the micro and meso level. The former looks into the effects of policy at the individual level, such as families, relationships and individuals. The latter analyzes the policy effects at the group level, such as organizations (i.e. hospitals, political parties) (Shanahan, et al., 2018). Looking at the Brazilian context, particularly in the Northeastern part of the country, one can see a political economy historically founded on the exploitation of individuals and the environment (McNeill, 2010). The history of development of Brazil will be discussed in another section, for now, it is important to establish the theoretical framework for my own research. First, I will define

political economy because it plays a central role in the discourse of various researchers of political ecology (Blaikie and Brookfield, 1987; Greenberg, 1994; Hempel, 1996; Peet and Watts 2004). Thereafter, I will provide an analysis of political ecology and branching theories by using case studies from around the world and Brazil. This theoretical framework will shed light on how the political economy and the environment are inherently related, and in the case of the Zika epidemic in the Northeast of Brazil, will help explain the shortfalls of government and public health policy in respect to preventing and effectively dealing with epidemics.

Political Economy

The term political economy, in its basic form, refers to the mutual relationship between political and economic systems and its subsequent effects on society. This dynamic can be applicable both regionally and globally given today's global context. The orthodox definition of political economy refers to the fundamentals of a market economy, that is, the production, labor, resource management, and the distribution of wealth of a nation (Smith, 1776). Political economy has evolved to incorporate not only economic traits, but also the political nature of an economic system. In Marx's own description of political economy, the issue of class arises. In his critique of the market economy, he identifies that the means of production is owned by few, the *bourgeoise*, and the working class can offer only their labor. This system will result in an uneven distribution of wealth, with the former amassing more capital and control of the economy (Marx, 1867). Brazil's own economy is grounded on a capitalist ideology. During much of its colonial period up until the 19th century, the monoculture economy, strategically concentrated in the coastal Northeast, depended on sugar exports produced via forced labor. The *senhores de engenhos* and *fazendeiros,* or sugar mill and large estate owners, essentially dominated the economy and created a socioeconomic structure that still reverberates today. The monoculture economy of the Northeast, dependent of slavery, kept human resources and infrastructure underdeveloped, and the distribution of wealth extremely concentrated

(Baer, 2008, p. 16). My research doesn't focus on the drawbacks of a market economy, rather the consequences of the relationship between politics and the economy, adding the environment as a contributing factor to Brazil's socioeconomic issues and ensuing public health policy outcomes.

Political Ecology

Using the political ecology framework, we can assess the link between politics and environmental problems. One of the consequences of the monoculture economy of the Northeast was a vast transformation of the environment, which had different effects on different segments of society. This is often the case with environmental change. Political ecology emphasizes the importance of evaluating the effects of transformations of the environmental on socioeconomic and political relationships (Bryant, 1992, p. 14). Environmental change can be separated into two categories: episodic and everyday. Episodic changes in the environment can be linked to seasonal weather patterns, such as droughts and floods. Everyday environmental change is a result of human activity and transformations of the environment resulting in soil erosion, deforestation and contamination of water ways among other issues. Even though environmental change affects society as a whole, it tends to unevenly effect marginalized groups of people along economic, racial, and gender lines. As stated by Bryant, "The interplay between processes of marginalization, and every day and episodic forms of environmental change can have tragic human consequences" (1992, p. 26). In the case of the Zika epidemic in the Northeastern of Brazil, majority of the people affected by the virus and its correlated congenital diseases such as microcephaly, happened to be poor, black, and female (HRW, 2017). Environmental changes, both episodic and everyday, converged to produce the conditions that were conducive to the outbreak, which affected marginalized populations unevenly. These environmental changes are rooted in government policy, historically based on economic and political incentives.

Bryant identifies three contextual sources of environmental change: State policies, interstate relations and global capitalism (1992, p.15). State policies refers to regional or federal governmental policies that directly affect the citizens of the State. Interstate relations include interactions between regional governments, such as state-to state commerce, within a nation. Global capitalism is defined as the economic interactions between nations. This can also be referred to the global political economy, characterized by market-driven, neoliberal economic policies that have fueled globalization (Gilpin, 2001). In Brazil these three sources have been a direct cause of environmental change, such as the deforestation of the Amazon and the *zona da mata* (forest zone) of the Northeast. Deforestation of the Amazon can be largely attributed to government policies that provided monetary inducements to promote large-scale investment cattle ranching and ecologically dubious hydroelectric dams. These policies often neglect a holistic approach to evaluating the political ramifications of environmental change. Additionally, the implementation of these policies doesn't consider the possible implications on public health and poverty. Research on the deforestation of the Amazon highlight the impact on the area's socially-disadvantaged groups (Binswanger, 1991; Moran, 1996). The massive push by the Brazilian government to promote cattle farming in the Amazon of the southwestern state of Acre in the 1990s disrupted the livelihoods of not only indigenous communities (Carvalho, 2000), but also rubber tappers and colonists, who relied on the extraction of forest products and agriculture respectively (Hoelle, 2011). Political ecology builds on political economy to study the role of power relations in human-environment interactions, as well as the influence of capitalism on local systems and decisions (Biersack, 2006). In this particular case study, the State's push for the expansion of cattle farming at the cost of massive Amazon deforestation altered power dynamics between the different social groups, creating tensions over land-based resources between the farmers, rubber tappers, and indigenous communities. Deforestation of the Amazon, fueled by government policies and economic incentives, underlines

how environmental and economic policy can have an adverse effect on different segments of society. These adverse effects tend to fall unevenly on marginalized populations; often the poor, the black, the indigenous and the female bearing the burden.

Feminist Political Ecology

Another element of political ecology is the gendered effect of environmental change. A feminist political ecology framework addresses the convergence of gender and environment in political discourse. Environmental change affect both women and men differently, especially in regard to the allocation of resources, environmental management and the creation of environmental norms of health and well-being. Feminist political ecology "treats gender as a critical variable in shaping resource access and control, interacting with class, caste, race, culture, and ethnicity to shape processes of ecological change" (Rocheleau, 1996, p. 4). In exploring the notion of a feminist political ecology in the context of Brazil and other similar settings, research reflects that the implications of environmental change vary between genders. A different case study on the State's promotion of large-scale cattle farming and subsequent deforestation of the Amazon in the southwestern state of Brazil documents how the expansion of this industry directly affected the environmental, economic and political interests of the *mulher seringueria*, or woman rubber tapper. As a result of the federal government's development policy of the Amazon during the 1970s and 1980s, women of the Xapuri indigenous community organized not only to defend the Amazon forest, but also improve the lives of rubber tappers by establishing political and economic autonomy through the promotion of labor rights, and investments in public health and education (Campbell, 1996, p. 31). This movement was largely driven by women, whose economic livelihoods were directly affected by the government's development policy consisting of massive deforestation of the Amazon.

Pertinent to my own research are the implications of political ecology on public health, particularly when poverty, gender and environmental degradation converge. Disease ecology is a concept that incorporates political ecology to understand how and why disease epidemics occur. Mayer defines disease ecology as the understanding of "how humanity, including culture, society, and behavior, the physical world, including topography, vegetation and climate, and biology, including vector and pathogen ecology, interact together in an evolving and interactive system, to produce foci of disease" (Mayer, 1996, p. 441). In brief, the political ecology of disease considers a region's social, political, environmental issues when analyzing epidemics. An important element of all these issues are the underlying power relations that can influence social, political and environmental outcomes, such as the control and management of resources. In other words, these issues are all linked with power and politics. In a study of the outspread of malaria in Trinidad, Fonaroff observed how the country's government advocated for economic policies that compelled farmers to work in the fields for longer periods and exposed them to malaria causing an outbreak of the disease (1968). Keep in mind that malaria is an arbovirus, meaning it is a virus spread by an infected mosquito. In this case, economic policies pushed by the government to attract foreign investment and economic development had the result of a malaria outbreak that affected primarily the impoverished farmers. In another study on a Hepatitis B virus (HBV) epidemic in the upper west region of Ghana, researchers observed how a lack of a coherent public health policy aimed at preventing the disease, compounded by structural issues such as poverty, infrastructure and lack of health care, were conducive to the HBV epidemic. HBV is spread by the transmission of bodily fluids, and researchers observed that a lack of information on the virus was a main cause of the epidemic (Mkandawire, et al., 2013). Even though this case doesn't explicitly regard the environment as a contributing factor to the outbreak, it does reflect how a lack of a coherent public health policy can lead to a easily preventable disease outbreak.

In the case of Brazil and the political ecology of disease, the Zika virus epidemic in the Northeast is just one example of the convergence of a region's social, political and environmental issues generating negative implications on public health. Given Brazil's natural environment, complemented by its precarious political institutions and economic policies, the country has been exposed to epidemics throughout its history of development. This is particularly the case in the Northeast, where for centuries the region's monoculture sugar economy fueled massive deforestation, contamination of natural waterways, and other radical changes to the environment, have continuously allowed the spread of disease via mosquitos. McNeill (2010) documents the history of epidemics in the Caribbean and coastal regions of South America, arguing that mosquitos and the viruses paired with massive transformations of the environment were fundamental in shaping today's sociopolitical context. As the ecology was transformed in order to accommodate sugar and coffee plantations, the ideal conditions were created for the proliferation of mosquitos and the viruses they carry. This was true in the 16th century, and it is true now, especially in Brazil. In an ecological study of dengue surges in São Luís, Maranhão in Northeast Brazil, researchers documented an increase of dengue cases in the subsequent months after the rainy season. As noted by the researchers, the increase of disease spread by mosquitos is correlated with environmental degradation and temporal weather patterns (e.g. rain), especially in urban areas with dense populations and poor infrastructure (Silva, et al., 2016).

As established in Chapter 1, Brazil has a long history of arboviruses and disease epidemics. This is a consequence of centuries of environmental degradation in order to accommodate economic and political interests. In other words, the political ecology of Brazil has been conducive to the proliferation of disease for centuries. A political economy, fueled by globalization and neoliberalism, has been a major source for Brazil's economic policies. This has led to massive transformations of the environment and has subsequently created the ideal conditions for the

continuous proliferation of infectious arboviruses. Epidemics are exacerbated when environmental changes are paired with poor infrastructure and poor public health policies, typically affecting marginalized communities unevenly. As stated by Bryant, "environmental change may not only reflect existing inequalities, but it may also insidiously reinforce them in the long-term." (1992, p. 26). In the case of the Zika epidemic in the Northeast, all these factors were conducive to the outbreak, which affected primarily poor women of color (HRW, 2017). Political ecology is an applicable theoretical framework to the circumstances in Brazil because it explains how ecological, political, economic, and socio-historical elements played a fundamental role in the outbreak of the 2015 Zika epidemic in Northeastern Brazil.

Weak Versus Strong States

Brazil's inability to address the public health crisis and the underlying issues that are conducive to epidemics, such as an ineffective infrastructure, inadequate sewage sanitation systems, and regular access to potable water, begs the question of the strength of the Brazilian state to provide basic services to its citizens. The strength of state can be measured by, among other things, "democratic consolidation, the rule of law, economic growth, and adequate provision of basic public goods" (Giraudy, 2012, p.599). While all these factors are relevant to the Brazilian context, the adequate provision of basic public goods and the constancy of public institutions in between governments really questions the strength of the Brazilian state, especially amidst the Zika epidemic and the concurrent government takeover of a political party. Accordingly, weak states can be measured by the state's limited capacity to deliver public goods (Acemoglu, 2005). According to economic theory, a public good is a commodity or service available at no additional cost to consumers (Holcombe, 1997). Public goods are also nonexcludable, meaning they are available to all (Cowen, 2019). In theory, military protection, public education, and infrastructure among other goods and services are all pubic goods. Weak states can be measured by their ability to consistently

provide public goods, even within different political regimes. The temporal dimension of a state's capacity comes into question, referring to "the degree to which a state's institutional capabilities are institutionalized, rather than being dependent on the particular individual or partisan occupant of executive office" (Kurtz and Shranck 2012, p. 616). In the case of Brazil, a political transition resulted in a reduction or end of public goods that were previously available during the predecessor's administration. The continuity of public goods in between political transitions is a suitable measure of State strength. The inconsistencies of the Brazilian state, in the case of the Zika epidemic, expanded the role of nongovernment organizations to deliver public goods the government is normally tasked with delivering to citizens.

With these theoretical frameworks in mind, this research aims to explain how national politics, specifically the transition from the Rousseff administration to the Temer administration, affected public health policy, in response to the Zika epidemic in 2015. In the next chapter, I will discuss how the Northeast's precarious political ecology, compounded by a political and economic crisis at the national scale, impacted *policy fields* that were implicated by the Zika epidemic. In other words, I will analyze the impacts on individuals at the meso level.

CHAPTER THREE | Policy Fields

"Agora o governo volta atrás"- The Zika Epidemic & the Brazilian State

The city of Recife reflects its colonial history and its hasty adaptation to a growing population and metropolitan area. The historical center is scattered with old buildings dating back to the brief invasion of the Dutch to glorious buildings erected during the peak of the Northeast's sugar export era. Some of these buildings have been preserved by the government and/or private owners; however, most buildings are victims of time and stand decrepit and exposed to a bustling city life. The Capibaribe River cuts through the center of town, spewing at last into the Atlantic Ocean after its 150-mile journey from the interior part of the state of Pernambuco. This river has played an important role in the history of the state as it was fundamental to the region's sugar plantation system in the 16th century. The river supplies water to over 1.4 million

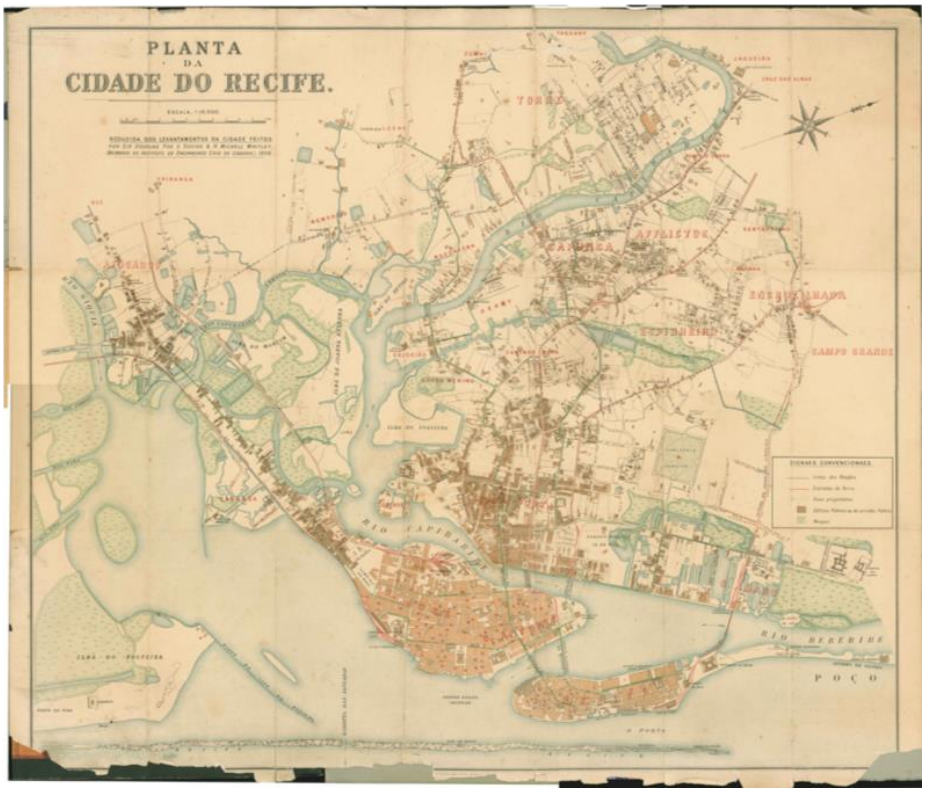


Figure 5. Public domain / Museo Paulista. (USP) Collection. Planta da Cidade do Recife. 1906. Museo Paulista da USP, São Paulo.

Figure 6. By E. Camarena. (2017) Rua da Aurora along the Capibaribe River. Recife, Pernambuco.

inhabitants distributed within 42 municipalities throughout the state and is also used for agricultural and industrial purposes. As a result, the river is exposed to significant domestic, agricultural, and industrial pollution (Herwehe, 2018). A study of water quality cited that "82% of Brazilian municipalities discharge most of their raw sewage into rivers that are used to supply the population with drinking water" (Sodré, et al., 2010, p. 58) Consequently, water quality in many Brazilian cities are exposed to contaminants. Some areas along the old city center have kept their colonial charm, for Recife is dubbed the 'Venice of South America' due to the channels that cut throughout the city and the colonial buildings that still glimmer along the river. However, the social disparities and environmental issues remain very visible. Along the banks of the Capibaribe river, the accumulation of trash is common, and the pungent smell of sewage is inevitable. The problem of open sewers is not particular to Recife, but many Brazilian cities. According to a study "nearly 90% of domestic sewage is released into the environment without any treatment, and 63% of household garbage is

dumped into rivers, lakes or other bodies of water" (Tesh, 2004, p. 56). Trash accumulation along the riverbanks is common, as seen in Figure 7.

The banks of the river are also the location of some of the city's most impoverished favelas, one of them located in *Bairro Coelhos,* or Coelhos neighborhood. The area where Coelhos is located is a place of extremes. The neighborhood is adjacent to the Capibaribe river and is situated in one of the oldest areas of Recife, making it rich in history and culture, but also home to many people living in poverty in Recife's favelas (Anjos, 2015). Residents of these favelas live on houses built on stilts, known as *palafitas*, along the riverbanks of the Capibaribe River (Ana, personal communication, 2017). Within a five-mile radius live some of the poorest people of Recife and some of the wealthiest. On my walk from the central, middle-class neighborhood of Espinheiro to the Coelhos neighborhood, you can see these issues unfold. My purpose to this area was to interview a doctor at the renowned Professor Fernando Figueira Institute of Integrated Medicine (*Instituto de Medicina Integral Profesor Fernando Figueira*: IMIP), a non-profit hospital that not only provides medical and social services to mainly impoverished individuals, it also serves as an educational and research institution. IMIP aims to provide services to Pernambuco's most vulnerable populations and is recognized as the one of the most important hospitals in Brazil. The hospital complex, comprised of ten buildings including the historic Pedro II Hospital, is located

Figure 7. By E. Camarena. (2017) Accumulated trash on the riverbanks of the Capibaribe River along Rua da Aurora. Recife, Pernambuco. July 2017.

within the historic Coelhos neighborhood (IMIP, 2019). Here, I would interview Dr. Castro, a sanitarian, psychologist, and former Secretary of Public Health for the city of Recife.

Policy Fields

This chapter will discuss the effects of the political and economic crises on different organizations located in Recife that responded to the Zika epidemic. One of the overarching themes that arises from discussions with the individuals that were interviewed for this research was the precariousness of government policies enacted by different administrations. That is, the changes in between governments were vastly different from one another, even in respect to the most basic services provided by the government such as access to education, healthcare, potable water and adequate sewage sanitation. This unpredictability, amidst a public health crisis, had a profound effect on the viability of many organizations and, more importantly, had a detrimental effect on people who were affected by the Zika epidemic. Organizations, such as hospitals and non-profit organizations, can be considered major components of policy fields, defined as "an identifiable set of elements in a specific environment that directly shape local public service provision" (Stone and Sandfort, 2009). These elements may include government institutions, hospitals, non-government organizations (NGOs), and community social networks, although my focus will be placed on NGOs that responded to the Zika epidemic, such as hospitals, non-profit organizations and individuals working in the area of public health. These organizations were directly affected by policy changes following the transition from the Rousseff to the Temer administration, especially with regard to public health policy. Before discussing the effects on these organizations, it is important to begin with an analysis of key policies during the Lula and Rousseff administrations, followed by a discussion of the policy changes subsequent to the political transition that occurred during the peak of the Zika epidemic. Given the region's political ecology, these changes reverberated across

different policy fields, particularly in the Northeast, and had a disproportionate effect on already marginalized communities.

Rise and Fall of the Workers Party

In the wake of the Zika epidemic, Brazil experienced a tumultuous political and economic period. In 2014, preparations to host the costly FIFA World Cup continued even as the Brazilian economy entered into its worst recession (Reuters, 2015). That same year, Dilma Rousseff of the PT had narrowly won re-election and her party, as well as other prominent political parties, were implicated in the Operation Car Wash (*Operação Lava Jato*) corruption scandal, which involved the state-owned oil company Petrobras (Felter and Labrador, 2018). The Lava Jato corruption scandal, as will be discussed, had far-reaching political and economic consequences. A contracting economy, inflated costs to host the World Cup, revelations of massive corruption, combined with the Zika epidemic essentially opened the door for Rousseff's opposition to initiate impeachment proceedings, charging her of violating federal budget laws. Rousseff's year-long impeachment process culminated in the end of her presidency and the ascension of Michel Temer of the PMDB to the presidency on August 31, 2016 (Lopes and Phillips, 2016). This research is centered on the spillover effects on different segments of society following the abrupt transition (Romero, 2016) from the leftist PT party to the right-leaning PMDB after the impeachment of Dilma Rousseff with particular focus on public health policy changes regarding the government's response to the Zika epidemic in the Northeast, the region hardest hit by the virus (Diniz, 2016). This section will center on the impact on organizations subsequent of the political, economic, and public health crises between 2016-2017.

The transition from the leftist PT party to the right-leaning PMDB was significant (Watts, 2016), especially in the Northeast where many people benefited from the social welfare programs that were implemented throughout the party's thirteen-year rule of the country (Hall, 2006, p. 699). Many of the people interviewed for this research agreed that during the PT's rule, there was

particular focus on investment in education, health, and poverty reduction programs (personal communications, 2017). Dr. Paes, a medical doctor, who works as a professor and researcher in the Department of Social Medicine at the Federal University of Pernambuco (*Universidade Federal de Pernambuco* [UFPE]), attested to some of these policies,

> *"o governo Lula, teve avanços, foi a retomada, foi o primeiro governo brasiliero de esquerda. E a gente teve avanços nas políticas píblicas em relação à erradicação, ao controle da miséria, controle da probreza… Teve avanços na saúde, no Sistema Unico de Sáude, sem duvidas"*
>
> [the Lula government, had advances, there was a comeback, it was the first leftist government in Brazil. And we had advances in public policies in respect to the eradication, control of misery, control of poverty… We had advances in health, in the SUS, without a doubt] (2017).

With the emergence of Brazil's first leftist government, considerable investments were made to the country's public health and education systems (Almeida, 2005). Perhaps the most important social welfare program implemented during the Lula administration was the Family Grant (*Bolsa Família* [BF]), which serves as a conditional cash transfer program that provides families a monthly stipend to households on the condition that parents keep their children enrolled in school and provide them routine medical care (Montero, 2010). BF consists of four subprograms focusing on education, health care, nutritional programs, and a gas subsidy which has benefited over 30 million of Brazil's most impoverished citizens (Hall, 2006). With the expansion of healthcare under the Unified Health System (*Sístema Único de Saúde* [SUS]), four main public health policies were created or expanded during the Lula period (Machado, et al., 2011). First, the Popular Pharmacy program (*Farmácia Popular do Brasil* [FP]), expanded access to medicine by subsidizing essential medicines (Emmerick, et.al., 2015). Smiling Brazil program (*Brasil Sorridente* [BS]), focuses on dental hygiene for low-income people. Mobile Emergency Services (*Serviço de Atendimento Móvel de Urgência* [SAMU]) created a

centralized ambulatory service. Lastly, the Family Health Program (*Estratégia Saúde da Família* [ESF]) expanded the reach of primary care providers, and was one of the main means for achieving universal healthcare (Machado, et al. 2011). The PT under the leadership of Lula was able to stabilize the country's economy and implemented various other social welfare programs, which had a profound impact in the Northeast, considered Brazil's poorest region. In 2003, the Northeast had the lowest GDP per capita in Brazil averaging $2,134USD compared to the national average of $4309USD (Love and Bear, 2009, p. 283). The Northeast also has the largest share of the population living in poverty (Love and Bear, 2009, p. 286). The socioeconomic context of the Northeast, characterized by high levels of poverty and racial disparities of the region, made the socioeconomic policies that Lula was promoting throughout his successful presidential campaign widely popular in the region, not to mention that Lula himself is from the small town of Caetés, in the interior of Pernambuco.

Figure 8. By E. Camarena. (2017) Family Health Program Unit. Recife, Pernambuco.

A Era de Lula: **Economic Growth through Developmentalism**

Luiz Inácio Lula da Silva, founding member of the leftist Workers Party (PT), was elected President of Brazil in October 2002 and served from 2003-2010. Lula changed Brazilian society in several ways. During his first year in office, Lula enacted BF, a conditional cash transfer program, which has helped millions of Brazilians living in extreme poverty. The BF is a public policy aimed at reducing poverty by guaranteeing families "the right to food and access to education and health." Since the implementation of BF, nearly 14 million people (Caixa.gov.br., 2019) living in poverty have benefited from the program, making it one of the largest direct income transfer programs in the

world. While the program has some flaws, BF has been immensely popular, especially when factoring the program's goals, that is to reduce poverty and hunger, increase access to health and education, and fostering citizenship amongst more disenfranchised Brazilians. Indeed, Dr. Castro, psychiatrist at IMIP and at one point, Secretary of Public Health for the City of Recife, acknowledged that there seemed to be more inclusion during the Lula administration, stating, *"a época do governo Lula e Dilma foi uma época inclusive. Foi uma época onde a preocupação era aumentar a participação social"* [the Lula and Dilma era was a more inclusive period. It was a period where the concern was to increase social participation] (2017). From Dr. Castro's perspective, programs such as BF increased the level of integration of people into Brazilian society, as it has helped millions of people out of extreme poverty. In regard to the objective of the BF program, it has been successful in fighting hunger, increasing enrollment in school, and ensuring basic health services for children. In a program evaluation study of BF, researchers determined that the program has been mostly effective in reaching its main objectives, such as reducing hunger and assuring children receive regular medical attention. An analysis of the program outcomes indicates that the poverty level in Brazil fell by nearly 20% between 2003 and 2005 (Rocha, 2009). Since the program's implementation, BF has helped to increase school enrollment for students age 6-15 by 18% (Glewwe and Kassouf, 2009, p. 516) Another study finds that BF is associated with better health outcomes as a result of an increase of doctor's visits, vaccinations, and preventive health (Shei, et al., 2014). Given the Northeast's socioeconomic context, the region "receives a disproportionately large share of BF funds due to its high prevalence of poverty" (Shei, et al., 2014, p. 2) In other words the Northeast is the most benefitted region of BF.

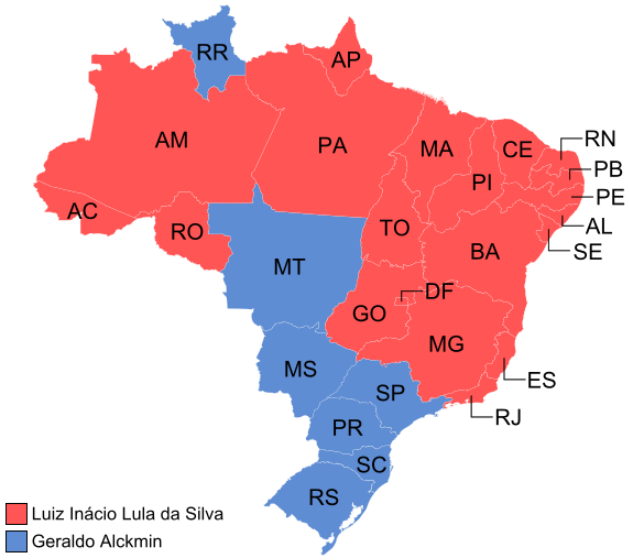


Figure 9. By Felipe Menegaz. (2006) 2006 Electoral Map.

The BF program has been weaved into the fabric of Brazil. Given the program's popularity, it has also become a political issue. Indeed, a major part of Lula's reelection in 2007 was contributed to the policy's success, particularly in the Northeast where he won by a healthy margin. As seen in Figure 9, Lula won reelection with substantial support from the North and Northeast regions, where BF was most successful. As mentioned before, BF was largely based on a policy program initiated by Lula's predecessor, Fernando Henrique Cardoso in the 1990s. In economic terms, Lula continued many of Cardoso's fiscal policies as well, mainly opening up Brazil's markets to foreign direct investment (FDI), expanding domestic industries, all while implementing distributive policies aimed at improving public health and education outcomes (Shei, et al., 2014). The Northeast was one of the regions that benefited most from these policies. An analysis by economists Alexandre Rands Barros and André Matos Magalhães suggest that there were two policy changes during Lula's first term in office that produced positive results in the Northeast (2009). First, Lula centered his candidacy and then presidency on eradicating poverty, thus there was an expansion of poverty alleviation policies, most notably BF. Given the socioeconomic conditions in the Northeast, these policies had a proportionately greater impact in the region. Secondly, Lula advocated for making Brazilian industries more competitive by investing (i.e. subsidies) in Brazilian industries and opening up the markets to FDI (Love and Baer, 2009). Some view Lula's economic policies as an evolved form of neoliberalism, dubbed neo-developmentalism, which posits that a strong economy is contingent of a strong welfare state (Morais and Saad-Filho, 2012). This policy

approach certainly led to improved economic conditions and public health outcomes of Brazil, particularly the Northeast, between 2003 to 2006. Additionally, Brazil won bids to host the 2014 FIFA World Cup (FIFA, 2007) and the 2016 Summer Olympics (Gabbatt, 2009), which was seen as an affirmation of Brazil's emergence on the global stage. On the national scale, Brazil experienced a period of economic growth and an expansion of welfare policies, which were conducive to his reelection. Lula was particularly popular in the Northeast, where over 70% of the vote went to Lula (Bohn, 2011). Many of the economic and social policies implemented throughout Lula's time in office proportionally benefited more people in the Northeastern states compared to the wealthier southern states. Towards the end of his last term in office, Lula was leaving with a growing economy, and with several successful social policies under his belt (i.e. BF, SAMU, BS, ESF). Indeed, in 2010 the Brazilian economy grew more than 7% with projections of continued growth. Major strides were made to stimulate the economy and reduce extreme poverty, but they continue to be major issues for the government of Brazil as seen during the succeeding administration of Dilma Rousseff.

O Governo de Dilma

Riding the wave of popular social policies and a growing economy of her predecessor, Dilma Rousseff won the presidential election in 2010 becoming Brazil's first female president. As seen from the electoral map (Figure 10), Rousseff won majority of the northern and Northeastern states, a reflection of the support gleaned from the previous administration's socioeconomic policies. Even though Rousseff inherited a growing economy, some of the policies enacted by Lula were unsustainable and did not address the root cause of

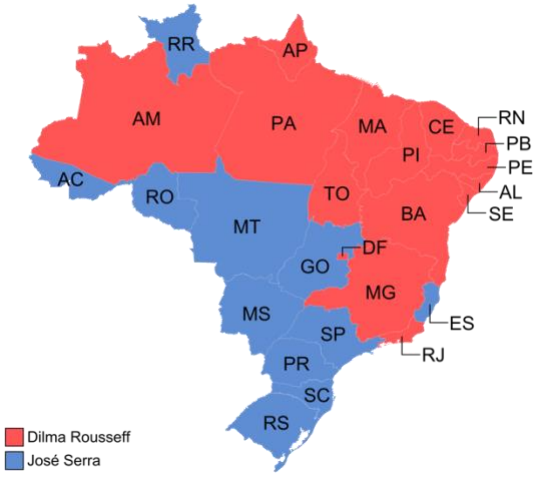


Figure 10. By Felipe Menegaz. (2010) 2010 Electoral Map.

Brazil's social problems such as income inequality, corruption, and a feeble infrastructure, especially in regard to basic government services like access to potable water and proper sanitation systems. Brazil was relatively sheltered from the 2008 global financial crisis mainly by pumping money into the economy and expanding the availability of credit to banks, thus stimulating consumer spending (Sobreira and De Paula, 2010); these fiscal policies proved to be unsustainable.

Dilma Rousseff was sworn into office on January 1, 2011. The economic success experienced during Lula's term was contingent of Brazil's consumer credit and commodity boom, which swelled public spending. One of the biggest challenges for the incoming Rousseff administration was to reduce public expenditures in order to control inflation and stabilize the economy. At the same time, Brazil was committed to host the world's most famous, and most costly, sporting events, requiring massive amounts of public funds to build or renovate stadiums and develop the proper infrastructure to host the events. Her domestic agenda aimed to stabilize the economy, expand poverty reduction programs (e.g. *Bolsa Família*), overhaul the country's tax code, and stimulate domestic industries largely via tax cuts. One of Dilma's most prominent public health policies was More Doctors (*Mais Médicos*), which aimed to address the shortage of medical professionals by bringing in doctors from around the world, mainly from Cuba (Oliveira, et al., 2015). While Dilma continued some of the policies enacted by her predecessor, her first term was mired by a contracting economy, multiple corruption scandals involving several political parties, and public outrage in response to the government's austerity measures and concurrent excessive spending on the World Cup and Olympics. In 2013, public protests in urban cores throughout the country started to erupt, making Rousseff's reelection bid the following year a highly polarizing contest. Her commitment to expand the social welfare programs initiated by the PT, as well as a commitment to stabilize the Brazilian economy, ultimately led to her reelection, albeit by a slim margin. Majority of her support came from the relatively poor Northeast, which proportionately

benefited more from social welfare policies enacted by the Workers Party. Rousseff's administration, although winning her reelection for a second term, was beleaguered by an economic recession, corruption scandals, and was confronted with inevitable spending cuts to public health care services and education. To add insult to injury, the Brazilian national soccer team was humiliated during the 2014 FIFA World Cup semi-finals with a 7 to 1 loss to Germany. As said by Eliana, a native of Recife, "*Nós perdemos a Copa, mais nós ganhamos o Zika*" [We lost the cup, but we won Zika] (personal communication, 2017). That same year, Brazilians were inundated with revelations of an extensive corruption scandal dubbed *Operação Lava Jato* that implicated federal and state agencies, high-ranking politicians of the and the state-owned oil company Petrobras. According to de Almeida and Zagaris, Petrobras' total "losses to the massive kickback and money laundering schemes are estimated to be $88 billion BRL ($31.5 billion USD)" (2015, p. 88). The PT was one of the most implicated parties since most of Petrobras' leadership positions were appointed by members of the PT and majority of bribes were also paid out to its own members (de Almeida and Zagaris, 2015; Segal, 2015). The Petrobras corruption scandal helped push Brazil into economic recession and shook the country's political system into crisis.

An Epidemic, the Olympics and the Impeachment of Dilma Rousseff

With an economy in recession and a litany of government corruption scandals, Brazilians were beginning to feel the effects of these crises reverberate. The Zika epidemic only exacerbated what many Brazilians, particularly people of the Northeast, already knew and lived. That is, years of government ineffectiveness (conceivably due to systemic corruption), a lack of basic services such as proper sanitation systems and access to potable water, an absence of comprehensive public health care policy, in combination with a tropical environment were conducive to the outbreak of the Zika virus, especially in the Northeast. In other words, the political ecology of the Northeast was a key factor of the Zika epidemic and consequent public health crisis. In February 2016, more than

200,000 reported Zika cases and an unusually high rate of children being born with microcephaly, principally in the Northeast (Lowe, et al., 2018), prompted the World Health Organization (WHO) to declare the Zika epidemic Public Health Emergency of International Concern (Tavernise and McNeill, 2016). Despite this declaration, the Brazilian government proceeded with steep austerity measures, cutting federal spending by nearly $6 billion USD, with the Ministry of Mines and Energy, Ministry of Education, and Ministry of Health bearing most of the cost (Alves, 2016). At the same time, the 2016 Summer Olympics were on track to be held in Rio de Janeiro, with an estimated price tag of $13.2 billion USD of public funds (Reuters, 2017). The Olympics were now considered an economic and political burden, in particular because the country was experiencing an economic recession and a public health crisis. Instead of investing money into long-term solutions to education, public health, and environmental issues (i.e. inadequate infrastructure systems), the government was pouring money into temporary projects that did not benefit Brazil as a whole. This prompted public protests throughout the country and fueled the opposition to resume with Rousseff's impeachment proceedings, who accused Rousseff of administrative misconduct and violation of federal budget laws. On August 31, 2016 Rousseff was officially removed from office by a 61-20 vote in the Senate ending the PT's thirteen-year rule of Brazil (Romero, 2016). Michel Temer, who served as vice president through a coalition between the PT and the PMDB party, ascended to the presidency and would further institute austerity measures to address Brazil's economic crisis.

"Um retrocesso" – A regression

Bairro da Boa Vista is an old neighborhood that received its name from the Palace of Boa Vista, home of the Dutch governor Maurice of Nassau, during Holland's brief occupation of northern Brazil from 1630-1654 (Vainsencher, 2007). Remnants of Dutch Brazil remain scattered

throughout Recife in the form of old buildings, churches, and bridges, many of them concentrated in Boa Vista and the surrounding central neighborhoods

On June 30, 2017, a national *greve geral* or general strike took place in response to President Temer's new round of proposed austerity measures that targeted social security and labor laws. Protestors, many of them union members and public workers who would be directly affected by these changes, congregated in *Praça do Derby* (Derby Plaza), adjacent to Boa Vista, carrying Brazil flags, red flags marked with the letters "PT," and many banners marked with phrases such as, *"greve geral"* and *"diretas já"* [4] (See Figure 11). There were many drum circles, passionate speeches being given, chants, live music, and libations going around. It felt more like a block party then a protest, but the sentiment was unanimous. They were all here to protest an unpopular president and his laws. After about an hour of these activities, the protest became a march down *Avenida Conde da Boa Vista*,

Figure 11. By E. Camarena. (2017) Greve Geral. Recife, Pernambuco.

[4] "Diretas já" is a phrase that refers to a 1984 civil unrest movement in Brazil which demanded direct presidential elections during the country's military dictatorship.

one of Recife's main arteries that leads to *Bairro do Santo Antônio* where the State Capitol is located at Princess Fields Palace (*Palácio do Campo das Princesas*). Along the avenue is an odd combination of old and new apartment buildings, shopping malls, grocery and retail stores, colonial buildings, government offices, and street vendors. Many of the walls, fences, and bus stations along the street are graffitied with "*fora Temer*" (out with Temer) and "*foi golpe*" (it was a coup), referring to the public sentiment towards Michel Temer, who became president via impeachment of Dilma Rousseff of the Workers Party, and who many in Brazil and the Northeast considered an illegitimate president due to a carefully conspired political coup that put him in power.

On my way to IMIP in the central neighborhood of Coelhos, located along the banks of the Capibaribe River, I walked again through the streets of Boa Vista. It was about noon and the skies were clouded with the promise of rain. I walked past a few churches, old buildings, and the occasional towering condominium interjected in between old buildings until finally reaching IMIP. The outside of the hospital is bustling with people. Along the fence of the ten-building complex stood patients, families and street food vendors; motorcycles and taxis parked along *Rua dos Coelhos* waiting for their next ride. I stepped inside through the main entrance, navigating my way to Dr. Castro's office located somewhere within the IMIP complex, which was originally the *Hospital Pedro II* founded in 1861 and has since evolved into a hospital, school, and research institution. It also served as an important organization during the Zika epidemic given its pediatric and maternal health units. In fact, many of the Zika and microcephaly cases were reported from this institution. While I was unable to interview a doctor, who treated parents with Zika and children with a form of congenital Zika syndrome, I interviewed a psychologist at IMIP who has worked directly with public health policy.

Dr. Castro has years worth of experience working with public health policy, especially as it relates to environmental health. As Secretary of Public Health for Recife, he saw firsthand the

problems that are conducive to the proliferation of Zika and other arboviruses such as chikungunya and dengue in the region. During his time as Secretary of Health he was confronted with a dengue and chikungunya outbreak in the city, both arboviruses carried by the *Aedes aegypti* mosquito. Given his experience with regional public health and environmental policy, Dr. Castro can speak to the Northeast's political and ecological circumstances that are conducive to viral diseases.

> *"Então você tem uma preocupação de autoridades públicas porque ela pode proliferar o virus, pela natureza do vírus, pela politicas publicas, pelas condições sanitárias que a gente tem, pelas condições de saneamento, pela condição de saúde pública que não é boa no geral, de recolhimento de lixo também, a limpeza urbana. A condição social do país e principalmente aqui do Nordeste."*
>
> [So you have a concern of public authorities because they can proliferate the virus, by the nature of the virus, by public policies, by the sanitary conditions that people have, by the sanitation conditions, by public health policy that is not good in the general, garbage collection also, urban cleanliness. The social conditions of the country and especially here in the Northeast] (personal communication, 2017).

Another way to view Dr. Castro's statement is that the political ecology of the Northeast has been a major factor in the region's history of disease epidemics. He mentions that the very nature of the virus, that is, the virus vector is a mosquito that thrives in tropical conditions, in combination with the region's public health and environmental policies have led the to the proliferation of viral diseases. This has been the case throughout the region's history.

According to Dr. Castro, *"o primeiro problema que tem é que a política de promoção de saúde com saúde ambiental não existe"* [the first problem that you have is that public policy that promote public health with environmental health does not exist] (personal communication, 2017). In other words, the regional government does not prioritize legislating environmental policy that will ultimately improve public health outcomes. Indeed, the Northeast has historically been the victim of multiple

arboviruses ranging from yellow fever, dengue to chikungunya (McNeill, 2010). Arboviruses are diseases transmitted mainly by mosquitos, which are abundant in tropical and unsanitary environments (Fauci and Morens, 2016). The solutions to solving health and environmental problems are multifaceted, says Dr. Castro,

> *"é um processo social, precisa de direitos básicos, saneamento, coleção do lixo, acceso a agua, saúde complete… políticas completas de sáude e vigilância ambiental"*
>
> [it is a social process, requiring access to basic rights, such as sanitation, waste collection, and potable water, access to comprehensive health care, and comprehensive public health and environmental policies] (personal communication, 2017).

In Dr. Castro's view, the prevention of epidemics can be accomplished through providing basic rights such as basic government services, including proper sanitation systems, dependable access to potable water, comprehensive health care and an environmental policy that promotes a clean urban space. Even though he recognizes that criticisms exist of both the Lula and Rousseff administration, Dr. Castro points out that during the PT government, more inclusive policies were implemented meant to expand the participation of Brazilians into society; stating, "*foi um período muito rico onde a sociedade se organizou e participou, deu opinão, decidiu e inluenciou nas políticas"* [It was a rich period where society organized itself and participated, expressed itself, decided and influenced politics] (personal communication, 2017). If any progress was made during the administrations of Lula and Rousseff of the PT to expand civil participation and address issues such as poverty, hunger, and health disparities which are abundant in the Northeast, they were quickly retracted with the emergence of Michel Temer of the center-right, pro-business PMDB party. In Dr. Castro's words, "*houve um retrocesso dessa política*," [there has been a reversal of those policies] (personal communication, 2017).

Only a few weeks after becoming interim-president, Temer initiated a reversal of many social policies that his predecessors had put in place. Some of these newly proposed austerity measures

included reducing the country's swelling healthcare costs, cutting BF benefits, reducing the education budget, and scaling back environmental protections (Watts, 2016). The country's shift to the right and prompt return to a neoliberal economic model was manifested by Proposed Amendment to Constitution No.55 (*Proposta de Emenda à Constituição n° 55* [PEC 55]), which freezes the existing levels of government spending on health care, education and social security for 20 years, only allowing adjustment in tandem to inflation. The constitutional amendment was approved by the Senate 53-16. Amidst an economic recession, the Brazilian government argued that PEC 55, dubbed the New Fiscal Regime (*Novo Regime Fiscal)* was necessary to wrestle with Brazil's high levels of public spending, stabilize the economy and attract foreign investment. However, these measures primarily target education, healthcare, and social security, which will disproportionately affect marginalized communities. Among the most affected by PEC 55 are public institutions, such as schools and hospitals, and people who depend on these services, in particular mothers of children with congenital Zika syndrome. The economic crisis and subsequent austerity measures also had an effect on NGOs and nonprofits, especially organizations who took a pivotal role in helping populations affected by the Zika epidemic.

"*o governo de Dilma foi a maior crise que nós já tivemos*"

For some NGOs who had already gone through their worst financial troubles during the peak of the economic crisis in early 2016, the fiscal policies that Temer passed had a marginal effect on their organization. This was the case in for the *Fundação Altino Ventura* (FAV), a philanthropic organization which mainly functions as a private hospital that targets low-income populations in Brazil (See Figure 11). FAV specializes in ophthalmological disorders and treats children at no cost and adults for a small fee. The hospital has served as an important healthcare provider for parents

whose children were born with variants of congenital Zika syndrome, which can cause ophthalmological disorders.

According to Dr. Valdes, "*o governo de Dilma foi a maior crise que nós já tivemos"* [Dilma's government was the worst crisis that we already had] (personal communication, 2017). When Dilma won reelection in 2016, the country was amidst its worst economic recession with inflation and unemployment soaring (Kiernan, 2015). As a result, the government started to implement austerity measures that targeted among other departments, public health and education and their subsidiaries, such as non- profit organizations who benefited from federal grants to function. NGOs, such as

Figure 12. By E. Camarena. (2017) Fundação Altino Ventura, Recife, Pernambuco.

FAV, that heavily relied on federal funds lost this source of income, triggering a shockwave to the operational capacity of the organization. In Dr. Valdes's view, FAV faced its worst financial crisis during the Rousseff administration since this was when budget cuts were initiated. Like most non-profit organizations continuously in pursuit of resource acquisition, FAV had to find other sources of revenue in order to continue its operations. As stated by Dr. Valdes, *"nós não tínhamos condições*

financeiras, então temos que captar recursos" [we didn't have financial conditions, so we had to fundraise] (personal communication, 2017). FAV did this by organizing small functions and sales, but mostly focused on applying for grants from international entities. Even though FAV was able to continue providing medical attention at no cost to children who suffered from microcephaly, Dr. Valdes says they [FAV] had to abandon various projects and lay off most of their staff in order to stay open: *"por causa da crise que houve no governo passado teve que terminar quase sem funcionários né deixamos vários projetos"* [as a result of the crises that occurred in the past government (Rousseff) I ended up with almost no employees and we abandoned various projects] (personal communication, 2017). Amidst the Zika epidemic, FAV was able to acquire lucrative grants from the United Nations Children's Fund (UNICEF) and the German government, especially since they were treating populations affected by the Zika virus and its linked congenital diseases (Dr. Valdes, personal communication, 2017). Non-government organizations were undoubtedly affected by the political turmoil and economic crisis that took place in 2016. Amidst a public health crisis, NGOs such as FAV were compelled to cut back on their organization's labor costs, abandon certain projects, and reduce some of the services that they provide. Nonetheless, given a financial structure that relies primarily on donations and intergovernmental and nongovernmental grants, some organizations were able to rebound from the Brazilian economic recession and subsequent austerity measures. On the other hand, public organizations, such as universities and public hospitals, were still adapting to the economic crisis and struggling for survival.

"Ele cortou tudo, ainda não cortou o ar que a gente respira."

I attended a research presentation at the *Hospital das Clínicas* (HC), adjacent to the *Universidade Federal de Pernambuco* (UFPE) in *Cidade Universitária* (University City) neighborhood of Recife, located about 15km west from the city center, or approximately an hour and a half commute on public transportation (See Appendix E). HC is a public hospital that serves mainly low-income patients,

and similar to IMIP, is bustling with people outside the hospital building. I got off the city bus and walked passed many families and food vendors mingling under the shade of trees. At this particular time of the day, the sun was beaming and it was hot and humid, but heavy rain clouds lurked nearby. I walked into the hospital through the main entrance, where I was redirected to another building behind the hospital, until I finally found the conference room where the presentation would take place. Letícia J. Marteleto and Sandra Valongueiro Alves would be presenting their findings on the impact of the Zika epidemic on women's reproductive intentions and behaviors in Northeastern Brazil. Their research concluded that while women may have wanted to avoid pregnancy during the Zika epidemic, women of low socioeconomic status had less access to family planning measures, including access to safe abortion, than their wealthier counterparts (Marteleto, 2017). The implications of these findings will be discussed in the next chapter, which focuses on the consequences on people, or micro level, resulting from the political and economic crisis in tandem with the Zika epidemic. As other research indicates, the Zika epidemic, by and large, had a disproportionate effect on women of color and of low economic status (HRW, 2017).

After the researchers presented their findings, a focus group materialized with five people including the two researchers previously mentioned. The focus group consisted of all women from various professional backgrounds, including two sociologists, a psychologist, a medical doctor, and an immunologist. All of them were either working directly with populations affected by the Zika epidemic and/or were conducting research on the virus, congenital Zika syndrome, and other public health issues. Some of their own experiences and research observations related to the Zika epidemic will be discussed in the next chapter; nevertheless, most provided insight on the effects on the organizations, or policy fields, they were affiliated with following the political changeover from Lula, Rousseff and Temer.

As the country's first leftist government, there was a large emphasis placed on social policies and inclusion during the administration of Lula. (Rocha, 2009) This idea was echoed by other people interviewed, including participants of the focus group. In the view of a focus group participant, "*os anos do PT foram anos dourados para quem trabalha em pesquisa e educão pública*" [the PT years were golden years for those who work in research and public education] (personal communication, 2017). During Lula's first year in office, funding for public education nearly doubled, and more funds were pumped into early childhood education and primary & secondary schools, in particular through BF (O'Neil, 2013). This was a major change in educational policy as more emphasis used to be placed on tertiary education which disproportionately benefited more affluent students given their higher university entrance exam scores (McCowan, 2007). Furthermore, the Lula and Rousseff administrations continued to expand racial quotas, allowing more people of color to enroll at prestigious federally-funded universities (O'Neil, 2013). In regard to public health initiatives, participants of the focus group indicated that the PT expanded grants to fund research on disease prevention and even abortion, which generally is taboo to discuss.

Many agreed that federal funding began to disappear with the Rousseff administration. As stated by a participant, *"na verdade, algumas dessas medidas que foram concretizadas no governo Temer já vinham sendo sinalizadas no governo Dilma"* [in reality, some of the measures that were concretized during the government of Temer were already being signaled during the Dilma government] (personal communication, 2017). As mentioned before, Dilma began to implement austerity measures that targeted Brazil's public health and education departments in order to alleviate the economic crisis.

When Temer ascended into office, he expanded these austerity measures and increased budget cuts to public health, education, and other social programs that were introduced by the PT. The magnitude of these cuts was expressed by a participant, *"ele cortou tudo, ainda não cortou o ar que a gente respira. Courto para pesquisa, serviços de saúde, recursos para as universidades, e recursos para educação em*

todos os níveis" [he (Temer) cut everything, he still hasn't cut the air that people breathe. He cut research, health services, resources for universities and education at all levels] (personal communication, 2017). Among agencies and programs that confronted steep budget cuts were SUS and the popular programs that it oversees such as the Family Health Program, which sends doctors and nurses to remote areas of the country, and the More Doctors program which addresses the country's shortage of doctors (Doniec, 2016). In the words of a participant, *"o programa Mais Médicos foi esvaziado!"* [the More Doctors program was emptied!] (personal communication, 2017). Many critics, including many of the people interviewed for this research, believe that this was a push by the Temer administration for the privatization of health care, as these cuts diminished the operational capacities of SUS and the programs it oversaw. From the perspective of a focus group participant, the PT government invested in the public, opposite of Temer, who embodied the classic neoliberal economic model, "*o governo petista com 13 anos, foi um período de investimento na questão pública, não privatização* " [the 13-year PT government, was a period of public investment, not privatization] (personal communication, 2017). Since the expansion of SUS under Lula, health care coverage increased from 13.2 to 120.2 million people (Massuda, et al., 2018) or roughly 80% of the population; the remaining 20% afforded private insurance. The Northeast region benefited immensely from the public health policies initiated with the PT governments (Love and Baer, 2009). Between 2014 and 2017, the unemployment and underemployment rate rose to 12.4% and 23.9%, respectively (Massuda, et al., 2018). Brazilians who could afford private health care plans had to transition to SUS, increasing the demand of these public services. Concurrently, austerity measures, most notably PEC 55, the constitutional amendment that limits public spending for 20 years, was approved by Congress in December 2016. Research shows that austerity measures and the push for privatization tends to have a disproportionate effect on marginalized populations, often along gender and racial lines. In an analysis of public expenditures from 128 developing countries,

evidence suggested that the fiscal policies implemented after the Great Recession of 2007 affected primarily vulnerable populations, such as children, women, the elder, and those living in poverty (Ortiz and Cummins, 2011). Thus, the austerity measures implemented to address the country's economic recession would have a devastating effect on vulnerable populations, particularly the women and children most affected by the Zika epidemic in the Northeast. By this time, an unusually high number of children being born with microcephaly and other congenital diseases were reported in Pernambuco (See Appendix D), prompting WHO to declare the Zika epidemic a Global Health Emergency. The government's inability to effectively deal with the public health crisis at hand was reflected in their response to the virus. First, the government focused primarily on vector control through fumigation campaigns of public spaces to eradicate mosquitos. (Gómez, et al., 2018). Secondly, a lack of information for health professionals and mothers concerning the virus and possible correlation with congenital defects in newborns, especially during pregnancy created another public health care crisis (Lowe, 2018). As mentioned by several people interviewed, the federal and regional government's response to the Zika virus was negligent; for example, they recommended pregnant women to simply avoid contact with the mosquito by staying indoors, wearing long sleeve shirt, and using bug repellant (Ministério da Saúde, 2019). The proliferation of the mosquito and the arboviruses they carry is linked with the systemic problems associated the political ecology of the Northeast. Put another way, the abundance of disease is linked with the region's natural environment, infrastructure, and inadequate environmental health policies (Souza, 2018). While the government focused on vector control, some NGOs expanded their efforts to promote family planning education and reproductive health care, particularly since the Zika virus is transmitted via the *Aedes aegypti* mosquito and sexual transmission (CDC, 2019).

"O discurso público não casa com a realidade"

A few blocks north of IMIP in the Boa Vista neighborhood are the offices of *Gestos*, a non-profit organization that advocates for reproductive health care rights emphasizing on HIV and AIDS prevention in Northeastern Brazil. The organization is divided into three main areas: education, activism, social services. During the Zika epidemic, Gestos launched several campaigns to promote sexual health education, one of them *Zika Coelhos,* which trains women living in the Coelhos neighborhood to serve as community health educators on the Zika virus and reproductive health rights. The program also incorporates environmental health and social determinants of health into their curriculum in order to provide a more holistic approach to reproductive health care. Social determinants of health can be understood as,

> "the complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors" (CDC, 2014).

In the organization's view, public health, environmental, and socioeconomic issues are all interconnected. Another way to view interpret this is that the regional political ecology can negatively influence public health outcomes. As stated by Ana, program coordinator for Gestos,

> *"quando você junta a comunidade de baixa renda, próxima do rio com diversas áreas de esgoto, de canais sem limpeza adequada do lixo, então tem uma série de fatores críticos, no nosso entendimento de que a Zika, os arboviruses são muito ligado a questão do determinante social da saúde"*
>
> [when you combine low-income communities, close to the river with several sewage areas, canals, lack of adequate trash collection, you have a series of critical factors, our understanding is that Zika, all arboviruses are very connected to the question of social determinants of health] (personal communication, 2017).

Ana was a lawyer and worked as a program coordinator for Gestos. She has served as Director of Human Rights and Coordinator of Women for the city of Recife, giving her direct knowledge on issues of gender and human rights in Recife. I met her at a conference at the *Fundação Joaquim Nabuco* located in the northern Casa Forte neighborhood, where she was presenting on the rise of conservatism and its influence on public policy, especially as it pertains to gender inequality. With this in mind, I asked her how the political transition from the PT to PMDB governments have affected Gestos and its operational capacities, *"Depois do golpe tem sido muito difícil. Após essa mudança de governo, que Temer assumiu, os ministérios deixaram de lançar esses editais"* [After the coup it has been very difficult. After this change of government, where Temer took over, the ministries stopped publishing edicts (grant announcements)] (Ana, personal communication, 2017). Ana was referring to federal grant announcements provided through different government ministries. During the PT governments, Gestos had acquired grants from the Ministry of Social Development (*Ministério de Desenvolvimento Social* [MDS]) and the National Secretariat for Women's Policy (*Secretaria Nacional de Políticas para Mulheres* [SNPM]). This has caused financial hardship for the organization, forcing Gestos to terminate projects aimed at monitoring human rights violations in Recife and other parts of Brazil. Like the Altino Ventura Foundation (FAV), another NGO in Recife, Gestos was forced to look for funding from international sources, such as the United Nations, the Ford Foundation, and the MAC AIDS Fund. Indeed, the *Zika Coelhos* program was made possible through funding from the United Nations Population Fund for Population Activities (UNFPA).

In addition to the economic crisis, Ana credits the rise of conservatism in national politics for the termination of federal grants, especially for organizations that advocate for reproductive health care rights (i.e. legal abortion) and HIV/AIDS awareness which tend to affect marginalized populations such as women of color and the LGBTQ community (Ana, personal communication, 2017). In Ana's view, *"agora existe uma presença muito grande de pessoas de uma matriz conservadora e de*

religiões conservadoras na política pública e nos serviços de saúde" [There is now a very large presence of people from a conservative matrix and conservative religions in public policy and health services] (personal communication, 2017). Many academics believe that the rise of conservative, right-wing populism is a global trend attributed to the economic backlash of globalization and its disproportionate effects on society (Rodrik, 2018). This phenomenon can be illustrated by the Brexit movement in the United Kingdom, the election of Donald Trump in the United States, Sebastián Piñera in Chile, and the election of Jair Bolsonaro in Brazil. The presidency of Bolsonaro, and its implications on public policy will be discussed in the concluding chapter; however, it is important to mention that the groundwork to his election began with the impeachment of Dilma Rousseff. Continuing the discussion of Temer and his policies during the Zika epidemic, Ana believes that the wave of conservatism Temer instituted stymied the government's overall response to the epidemic, especially since the virus could be sexually transmitted. In Ana's view, *"falta a parte da prevenção, da educação sexual integral, que ainda é algo inexistente no nosso país"* [There is a lack of prevention, of comprehensive sexual education, which is still non-existent in our country] (personal communication, 2017). In other words, a lack of comprehensive sex education can be attributed to Brazil's history of conservatism, adding that without an all-encompassing approach to public policy that includes prevention and reproductive health education, it will be impossible to overcome some of the social determinants of health inequities attributed to the frequency of arboviruses in the Northeast. Both the Rousseff and Temer governments failed to incorporate a reproductive health component in its response the Zika epidemic, focusing instead on vector control. In Ana's view, the government's reaction to the virus failed to see the reality of the crisis, *"o discurso público não casa como a realidade"* [public discourse does not match reality] (personal communication, 2017). Put differently, the social determinants of health inequities, or the political ecology of the Northeast,

such as the region's environmental and public health policy, sanitation issues, and lack of access to potable water, continue to be ignored by the Brazilian government.

Significant improvements were made to public health and education during the PT's thirteen-year rule of Brazilian politics. During the Lula period, social policies were implemented that greatly expanded access to health care, increased access to education and brought millions of Brazilians out of extreme poverty. Additionally, Lula accomplished unprecedented economic growth, largely through a commodity boom, and positioned Brazil as an emerging global power. The social and economic policies implemented by Lula's government proportionately benefited the Northeast of Brazil, considered the country's poorest region. This can be attributed to the Northeast's political ecology, which reflects a history of social, political and economic inequalities in tandem with a constantly changing environment that generate negative public health outcomes along racial, gender, and economic lines.

Dilma Rousseff, Brazil's first female president, continued many of her predecessor's policies during her first term. Rousseff narrowly won re-election, despite an economy in recession, the Zika epidemic and subsequent public health crisis, and implications of rampant government corruption. These conditions ultimately led to her political demise when she was methodically impeached by the center-right opposition. Michel Temer ascended to the presidency, implementing austerity measures that created shockwaves to the operational capacities of public and non-government organizations. A return to the classic neoliberal economic model is best illustrated by constitutional amendment PEC 55, which froze public spending for 20 years. Many of the social policies that were implemented during the PT government were quickly rolled back, disproportionately affecting marginalized communities.

Whilst the implementation of austerity measures, the Northeast was facing the Zika epidemic and its linked congenital defects in newborns more than any other region in Brazil. Once

again, the issue of the Northeast's political ecology arises. The region's natural environment, combined with poor infrastructure, lack of sanitation systems, access to potable water, and inadequate environmental and public health policy were key factors in the proliferation of the vector, the *Aedes aegypti* mosquito. Rather than address the systemic issues at the root of epidemics, the government focused on vector control and shifted responsibility onto its citizens. During Brazil's economic, political, and public health crisis, policy fields, or elements in a specific environment that directly shape local public service provision were directly affected by the austerity measures implemented by Temer. Public hospitals and universities were confronted with steep budget cuts, forcing massive lay-offs, a reduction of services they could provide to the public, and loss of research funding. NGOs also had to lay-off staff, terminate community programs, and scramble for other sources of income, primarily from other governments and international non-governmental organizations. The drastic reversal of social policies and cutback of government spending caused a shockwave to the operational capacities of public organizations and NGOs, disproportionately affecting marginalized communities.

From Dr. Castro's viewpoint, "*agora o governo volta atrás*" [now the government backtracks] (personal communication, 2017), implying that the government has rescinded its commitment of providing basic services to Brazilians. The political instability and lack of consistency of basic government services in between administrations begs the question of the Brazilian state's strength. The strength of state can be measured by, among other things, "democratic consolidation, the rule of law, economic growth, and adequate provision of basic public goods" (Giraudy, 2012, p.599). While all these factors are relevant to the Brazilian context, the adequate provision of basic public goods really questions the strength of the Brazilian state, especially amidst the Zika epidemic and the concurrent government takeover of a political party. The temporal dimension of a state's capacity comes into question, referring to "the degree to which a state's institutional capabilities are

institutionalized, rather than being dependent on the particular individual or partisan occupant of executive office" (Kurtz and Shranck, 2012, p.616). In the case of Brazil, social policies that took years to be implemented were diluted or terminated within months of a new political reality. The inconsistency of social and economic policies can make citizens wary of their state's capacity to deliver on basic public goods and hinders the possibility of any lasting progress. In Dr. Valdes's view, "*nossa preocupação agora é somente que nosso país possa sobreviver aos desafios que estamos enfrentando e que a liderança do nosso país possa ofrecer soluções para que não seja somente uma coisa temporário*" [our concern now is that our country can survive the challenges that we are facing and that country's leadership can offer solutions that are not just temporary] (personal communication, 2017). The government's inconsistencies often pose a greater risk to society's most vulnerable populations. As witnessed with the fallout of the Zika epidemic, women were the most affected by the crisis (HRW, 2017). In the following chapter, I will discuss the effects of the crisis on the *mulher Nordestina* (Northeastern woman).

Figure 13. By E. Camarena. (2017) Mulher Nordestina - Northeastern Woman.

CHAPTER FOUR | *Mulher Nordestina*

"o governo não cumpre"- Brazil's broken promise

In the previous chapter I discussed how the political and economic crisis affected organizations that were working in response to the Zika epidemic. Public organizations, such as hospitals and public research institutions, experienced a financial crisis as a result of the austerity measures implemented by the Temer administration. With limited resources, the availability of public health care services was reduced. Nonprofit organizations also were affected by budget cuts yet were able to stabilize their finances through an aggressive search of funds from international sources. Both public institutions and NGOs had to cut back on the services they were able to provide, which affected the people who depended on their services. This chapter will discuss how the political, economic and public health crisis affected people, in particular women of the Northeast. In qualitative research, this particular group of people are typically difficult to recruit, so snowball method of recruitment is regarded as an effective recruitment technique. Indeed, I met Andrea immediately after interviewing Dr. Valdes through her suggestion. First, I will discuss a case in which the Zika epidemic affected a dark-skinned, low-income woman through the lens of Andrea,

whose child was born with microcephaly during the peak of the public health crisis. I will then contrast these experiences through the lens of Brenda, a middle-class, lighter-skinned woman, with a healthy child of roughly the same age. Case studies are helpful in explaining phenomena that is occurring in the world around us because they force the researcher to dig deeper and develop a more detailed investigation (Rowley, 2002). In the cases of these women, both were affected by the crises albeit in categorically different ways. The issue of how the government rescinds its commitments to Brazilians in a time of crisis stands out in both cases, principally in failing to provide comprehensive health care services and ensuring access to adequate infrastructure. Andrea, who is darker-skinned, low-income, and a resident of an impoverished area represents segments of the population who were most affected by the Zika epidemic. Microcephaly cases were highest among low-income women, who tend to be exposed to a precarious political ecology. Furthermore, Andrea depends more on public services provided by the government and nonprofit organizations. On the other hand, Brenda, who is lighter skinned, middle class, and lives in a multistory apartment in central Recife was less affected by the Zika epidemic, but directly affected by the economic and political crises that was occurring in the country. As will be discussed below, these issues tend to disproportionately affect Brazilians along gender, racial, and socioeconomic lines. In other words, the populations most affected by the government's inconsistencies are often women, darker-skinned, and of a low socioeconomic background.

Andrea - *"o governo não assume nada"*

I walked in at 7:30am into the lobby of the FAV hospital, and there was already a line of people waiting to get treatment. The lobby was lined with rows of chairs occupied with people young and old; the sound of children crying and people chattering in Portuguese filled the room. In the wake of the Zika epidemic, FAV served as an important healthcare provider for low-income parents whose children were born with variants of congenital Zika syndrome (i.e. microcephaly). In

total, FAV provides services ranging from vision care, physical therapy, and other medical and social care for 285 Zika babies in the state of Pernambuco (Dr. Valdes, personal communication, 2017). I was here to meet Dr. Valdes, Vice-President of FAV, to discuss the implications of the political and economic crisis on her organization. Unexpectedly, I was given a tour of the four-story hospital, and I left with a better understanding of not only the organizational effect, but more importantly how these crises affected people. One thing was very clear from visiting the FAV hospital: most people there were low-income, darker skinned, and female.

Figure 14. By E. Camarena. (2017) Physical Therapy Room, FAV, Recife, Pernambuco.

The first floor had a hallway that led to a private community space. Here, mothers could nurse, prepare food or entertain their children while they wait for their appointment. Next to this community area was a small meeting room used for support groups and therapy sessions. Further down the hall was a physical therapy room where a toddler who suffers from microcephaly, probably 2-3 years old, and her therapists performing walking exercises (See Figure 13). I was told this patient is one of the only children that was diagnosed with microcephaly and could actually walk. Along the wall of the physical therapy room were smaller rooms where individual therapy sessions took place. Inside one of them another child with microcephaly was being treated. This

child was undergoing tactical therapy, where the therapist had different textural objects and materials the child was touching.

Figure 15. By E. Camarena. (2017) Multisensorial kit used for children with microcephaly, FAV, Recife, Pernambuco.

On the second floor there was another waiting area surrounded by doors to leading to rooms patients received specialized treatment. One of these doors led a musical therapy room, where I was invited to participate in a session along with two other children (about 4-5 years) and their mothers. We sang a song and moved our fingers according to each verse. This exercise was meant to test listening and attention skills. I met another mother and her daughter waiting for treatment. The baby girl, 1 year and 6 months, had microcephaly and was just beginning to open her eyes for the first time. She had on a pair of small glasses that blocked light, as natural and artificial light could irritate their eyes. The little girl was staring off curiously in every direction.

The third floor of the hospital is where adults get treatment for conditions such as glaucoma. The administrative offices are located on the fourth floor. After the hospital tour, I sat with Dr. Valdes to discuss how FAV has managed with the fallout of the crises of Brazil. When our interview concluded, I was told I could meet a mother and her daughter. We went back to the first floor in one of the small rooms adjacent to the physical therapy room, where I met Andrea and her 1 year, 6-month-old daughter, who was diagnosed with microcephaly five days after being born.

I walked into the room and introduced myself to the nurse and Andrea. The room was small and had a medical examination table, where colorful objects of different textures lay, and two chairs in the corner (See Figure 15). The walls had different physiology posters on them, including one

showing the effects of microcephaly on a child's skull. Andrea was sitting on a chair holding her daughter in her lap, the baby was wearing a bright pink onesie and a white bow on her smaller than normal head. They had just finished their weekly therapy session with the nurse, where they played with the objects that were laying on the table to develop the child's senses. Andrea was 31 years old, a mother of two, married and darker skinned. She was from Camaragibe, Pernambuco, a middle-sized city northwest of the metropolitan area of Recife. Camaragibe is one of the poorest cities in Northeastern Brazil (Sugiyama and Hunter, 2013, pg.48). In fact, 74.5 percent of the population fall below the poverty line and only 40.5 percent of the city's residents have access to adequate sanitary sewage (IBGE, 2017). The residents of the city live in sanctioned and non-sanctioned homes scattered throughout hillsides (Bandeira, et al, 2004), and the Capibaribe River flows along the west and south ends of the city (See Appendix E). During the rainy season, typically between March through August, residents are at risk of landslides (Bandeira, et al, 2004), and also extreme flooding (Globo, 2016). As expected, this environment also creates the ideal conditions for disease carrying mosquitos.

Andrea and her daughter took the bus from Camaragibe to Recife once a week for her physical therapy session at FAV. Their visit to FAV was just one of multiple doctor visits they make during the week to different hospitals and clinics throughout the metropolitan area of Recife. Life has drastically changed for Andrea and her family, as a child with a disability requires constant attention and medical services. Andrea, who also has an 11 year old son, tells me, *"nossa vida é dedicada aos filhos, ela fica o tempo todo junto comigo, não fica com mais ninguém além de mim, me acompanha em todas as minhas actividades"* [our lives are dedicated to the children, she stays with me all the time, she does not stay with anyone but me, she accompanies me in all my activities] (personal communication, 2017). While her husband is at work, she would tend to housework and childcare that included taking her daughter to the doctor throughout the week. Her daughter was diagnosed

with microcephaly five days after being born, which was a complete shock to Andrea and her husband, "*ficamos em choque e entramos em depressão pois não esperávamos que ela fosse nascer assim"* [we were in shock and became depressed because we were not expecting her to be born this way] (personal communication, 2017).

Andrea stated that neither she nor her husband showed signs of the Zika virus, and they took all precautionary measures indicated by the government to prevent the spread of the mosquito. The Zika virus, like similar arboviruses, are asymptomatic, meaning they show little to no clinical symptoms. In fact, one in five infected individuals may develop clinical symptoms such as a rash, itching, fever and conjunctivitis (Ginier et al., 2016). These symptoms can also be confused with those of other arboviruses like dengue and chikungunya, which are common in Brazil. It is possible that Andrea or her husband were infected with the Zika virus and were unaware of it. While the direct causality between Zika virus and microcephaly has not been fully proven, there is a strong association between the virus and the congenital disease (Mateja, et al., 2016). Microcephaly and other congenital abnormalities can be detected through ultrasound as early as twenty weeks into pregnancy (CDC, 2018), requiring comprehensive prenatal care throughout the gestation period. In a national study, results show a high coverage of prenatal care in Brazil, but gaps exist such as accessing health care, completing all recommended procedures (i.e. ultrasounds) and the quality of services provided (Viellas, et al., 2014). Low prenatal care coverage was observed in the Northeastern region of Brazil, where completion of routine appointments and exams, such as ultrasounds, were the lowest in the country (Viellas, et al., 2014). While prenatal care is nearly universal in Brazil, service discrepancies are proportionately higher among black and low-income women in the Northeast. This may be a reason why microcephaly was undetected in Andrea's daughter, even though she pointed out that her pregnancy had no complications and she had attended all recommended medical appointments. When their daughter was diagnosed with

microcephaly, Andrea and her family were in disbelief since they were emotionally and financially unprepared for the arrival of a child with a disability. At a time when little information was known of the Zika virus and its linked congenital disorders, the government had an inadequate response to the public health crisis and left many Brazilians vulnerable to the disease (HRW, 2017). As stated by Andrea, "*tivemos que procurar tratamento e tendo em vista que hoje em dia está tudo muito difícil"* [we had to look for treatment since everything today is very difficult] (2017). Given the nuance of the Zika virus and the birth defects associated with the virus, there was no clear information provided by the government to affected families.

Between October 2015 and December 2016, over 10,000 cases of Zika-related microcephaly were reported to the Ministry of Health; 76% of suspected cases were reported in the Northeast (MS, 2017b, p.90). The Brazilian government, at the time headed by Dilma Rousseff, primarily focused on vector control, increase access to healthcare, and support for research development (Gómez, et al. 2018). In February 2016, a massive campaign to eradicate the *Aedes aegypti* mosquito was launched by Rousseff, where 220,000 soldiers and 300,000 health workers were sent on house-to-house visits to eliminate potential breeding grounds for the mosquito, distribute mosquito nets and bug repellant, and fumigate public and private spaces (Douglas, 2016). To increase access to health care, the federal government boosted funds available through *Bolsa Família* for families affected by the Zika virus, invested in the expansion of more Specialized Rehabilitation Centers and allotted more money to the Family Health Program (Gómez, et al., 2018). Lastly, the federal government invested funds into research and development for the preventing, diagnosing, and treatment of Zika virus and other arboviruses (MS, 2017a). While the federal government made an effort to address the Zika epidemic, many people believe it was insufficient and lackluster, especially since it did not include a plan to address the systemic causes for the Zika epidemic, that is, poor sanitation systems, access to potable water, and comprehensive health care. To add, the abrupt

political transition amidst the public health crisis hampered any significant improvements to public health policy. Improvements to SUS made during the previous PT government, were reversed, most notably through slashing the agency's budget, thus limiting the government's long-term response to the Zika epidemic, which families were still living with. As Andrea points out, "*o governo daqui não está dando suporte mais, paguei uma consulta para ela em uma clínica particular que custou $300 reais, isso com o dinheiro dela já que eu não posso trabalhar, pois corta o benefício da criança"* [the government no longer provides assistance. I paid for a consultation at a specialized clinic that cost $300BRL ($77USD), using her money (child's BF benefits]) because I can't work otherwise the child's benefits end] (personal communication, 2017). In a single-income household, $300BRL can make a significant dent in the monthly budget of a four-person family. Andrea was unable to work, first because she had to take care of her daughter, and secondly, she would no longer qualify for BF as they would exceed the allowed threshold. Currently, families qualify for BF if the monthly income per person is between $89BRL to $178BRL (roughly $23USD to $45 USD) (Caixa, 2019).

From Andrea's point of view, the situation in Brazil has worsened since Temer took office, *"o Temer é, ele é pior ainda, no tempo de Dilma e Lula não era assim, mas agora está demais, tudo caro, o governo federal não está repassando verba para cá"* [Temer is even worse, during Dilma and Lula's time it wasn't like this, but now it's too much, everything is expensive, the federal government is not giving assistance here] (personal communication, 2017). As previously discussed, the political transition from the PT government to the right-center PMDB brought along sweeping changes. Austerity measures that targeted the budgets of the Ministry of Education and Ministry of Health primarily affected people who depended on these services, especially during and after the Zika epidemic. Given that most people in the Northeast depend on services provided through SUS, Andrea was directly affected by these budget cuts as benefits they used to received were significantly reduced or disappeared altogether. This resembles a pattern felt by mothers of children with variants of

Figure 16. By E. Camarena. (2017). Waiting room in FAV, Recife, Pernambuco.

congenital Zika syndrome, who feel forgotten by the government: *"o governo federal não dá, nós estamos sofrendo"* [the federal government doesn't provide for us, and we are suffering] (personal communication, 2017). During the Zika epidemic, nearly 3,000 children were born with microcephaly throughout Brazil (Satterfield-Nash, et al., 2017). Most confirmed microcephaly cases originated in the Northeast region of the country (MS, 2017b, p.90) As children with microcephaly grow older, they will continue to require medical attention. A study by the CDC indicated that "children with microcephaly and laboratory evidence of Zika virus infection have severe functional limitations and will require specialized care from clinicians and caregivers as they age" (Satterfield-Nash, et al., 2017, p. 1347). As the medical attention and needs for these children expands, the government has minimized available resources. This situation becomes more problematical since most of the children born with microcephaly are from low-socioeconomic status and mostly depend on government provided healthcare through SUS (Belluck, 2017). As a result, many children do not receive the full array of services that microcephaly and other congenital diseases requires. In the case of Andrea, she and her daughter need to travel from Camaragibe to Recife multiple times per week, where most specialists are located. What is more, Andrea can only afford some of the services and medicines, so she is forced to decide which therapy or medicine is more urgent. Access to care and

affordability of services seems to be the biggest barriers to healthcare, which tends to disproportionately affect low-income, darker skinned women.

A report by Human Rights Watch suggests that the Zika epidemic disproportionately impacted low-income, darker skinned women and girls (HRW, 2017). The government responded to the Zika epidemic by focusing on vector control and slightly increasing funding to public health services but failed to address the systemic issues that were conducive to the epidemic. For one, the government has not provided a comprehensive approach to public health policy that includes reproductive health care and education which teaches women and men how to protect themselves from diseases and unplanned pregnancy. During the Zika epidemic, there was an upsurge of women seeking clandestine abortions (HRW, 2017). Of equal importance to eradicating disease is addressing Brazil's poor infrastructure. Andrea spoke to both these matters, indicating that she never received any form of sexual education in school and to the latter:

> "*Cadê o governo? A limpeza de canal, essas coisas, ninguém faz nada, vai continuar igual, como o nosso país é corrupto, tanto o que as mães estão sofrendo, com dengue, com lixo, ninguém está fazendo nada, e o governo não asuume nada"*
>
> [Where's the government? Cleaning the canal, those things, no one does anything, it will remain the same, as our country is corrupt, as much as mothers are suffering, with dengue, with trash, no one is doing anything, and the government assumes nothing] (personal communication, 2017).

It is clear to many Brazilians that their government has largely failed to assume its responsibilities of providing public health care services, adequate infrastructure and sanitation systems, and reliable access to potable water. Like many Brazilians I met, they are determined to move forward. As stated by Andrea, *"nós estamos na luta pelos nossos filhos, e a vida continua"* [We are fighting for our children, and life goes on] (personal communication, 2017). Even though the Zika epidemic and concurrent

political and economic crises affected Brenda differently, she shares the same optimism and determination to provide a better a life for her child.

Brenda - *"o governo não cumpre a parte dele"*

The Espinheiro neighborhood is located northwest of the old city center of Recife. This middle-class neighborhood is mostly a residential area, consisting of some retail stores, restaurants, and hospitals. Unlike other areas of the city, the streets of this neighborhood are relatively clean and well-maintained. Large trees shade the streets, vehicular traffic is minimal, and the Capibaribe River and its network of canals spare the streets of the Espinheiro neighborhood.

Brenda and her two-year old son live in a two-bedroom apartment located on *Rua da Hora* (Hour Street) in a mid-sized apartment building probably built in the sixties. Like many of the towering condominiums scattered throughout the city, a doorman buzzes you in and out of the apartment building. Brenda rents out a room of her apartment through Airbnb[5], which is how I met her. I lodged in Brenda's apartment for nearly a month while I conducted research. As Brenda indicates, many Brazilians who were displaced by the economic crisis have resorted to the 'sharing economy'[6] by driving for Uber[7] or renting all or part of their homes through Airbnb. Brenda, who was pregnant during the Zika epidemic, was not personally affected by the virus; nonetheless, she lost her government job and accompanying benefits as a result of the political and economic crisis. Accordingly, the economic recession and concurrent political turmoil also negatively impacted Brazil's middle class.

[5] Airbnb is a lodging and hospitality website and mobile application used primarily for homestays and tourism.
[6] 'Sharing economy' refers to an economic system that uses online platforms to commodify services such as transportation and housing through peer to peer interaction. There are three main reasons the sharing economy has expanded over the last ten years: 1) expansion of technology, 2) sustainability efforts, and 3) economic necessity (Renau 2018).
[7] Uber is a ride-sharing service mobile application used for transportation.

Brenda was 35 years old, a mother of a two-year old healthy boy, and lighter skinned. She comes from a middle-class family, and attended private schools up until college, when she tested into the *Universidade Federal de Pernambuco* (Federal University of Pernambuco [UFPE]). After finishing her degree, she moved to São Paulo where there were more economic opportunities, stating, *"aqui é muito carente, as pessoas saem para buscar mais lá, porque tem outro nível de desenvolvimento, que é o centro financeiro do país"* [everything is lacking here, people leave to search more over there (São Paulo) because it has another level of development as it is the financial center of the country] (2017). Migration from the poorer Northeast cities to the Southeast has been a historic trend due to the concentration of resources in Brazil's larger, more industrialized cities of São Paulo and Rio de Janeiro (Baer, 2008, p. 250-252).

Brenda returned to Recife at a time when the region was experiencing unprecedented economic growth. During the Lula administration, the Northeast experienced significant growth since many of Lula's socioeconomic policies, like BF and CrediAmigo – a micro credit program, proportionately benefited the region. Indeed, the Northeast experienced an economic boom where the region's GDP grew by 4.2% a year. In the state of Pernambuco alone, the economy grew by 9.3% in 2010 (Catching up in a hurry, 2011). Brenda witnessed the changes that Lula's administration brought to the Northeast and Brazil, *"Historicamente, a gente sentiu uma mudança muito grande desde que o PT chegou ao governo, com o Lula."* [Historically, people felt a big change since the PT came to power with Lula] (personal communication, 2017). The PT governments invested heavily in health and education. In Brenda's view, *"para mim foi muito claro, coincidiu com o período em que eu me formei na faculdade, na Universidade Federal, Universidade Pública, e das melhorias que vieram desde a educação*" [For me it was very clear, it coincided with a period when I was in enrolled in university, and the improvements in education could be seen] (personal communication, 2017). Brenda witnessed the

expansion of education, saying that she herself benefited from some of the policies enacted during the Lula and Rousseff administrations.

The improvements in education that Brenda saw via policies implemented by the PT governments were quickly disintegrated with the ascension of Temer into office. From Brenda's perspective,

> *"com a entrada de Temer, a primeira mudança significativa que me afetou diretamente, foi a minha exoneração de um cargo de uma empresa do governo federal. E onde houve uma demissão maciça por essa mudança que houve nas pastas em cada ministério, sobretudo na pasta da cultura, na pasta da educação, que são as áreas com as quais eu trabalho. Foram mudanças drásticas de ministros."*
>
> [with the entrance of Temer, the first significant changes that affected me directly were being dismissed from my position at a federal agency. There were massive firings as a result of funding changes in each ministry, especially in funding to culture, education, in the areas that I worked. There were drastic changes in the ministries] (personal communication, 2017).

As stated in the previous chapter, severe austerity measures were implemented quickly after Temer ascended to the presidency. These neoliberal economic policies were implemented with the objective of significantly reducing public spending, liberalize the markets and stabilize the economy. The Ministry of Health and Ministry of Education had their budgets slashed, prompting massive layoffs. Brenda was one of many Brazilians that lost their jobs*: "Teve uma onda imensa de desemprego, muito grande. Eu nunca vi tanta gente próxima desempregada, como eu estou vendo agora, e por tanto tempo"* [There was an immense unemployment wave, very big. I've never seen so many unemployed people as I'm seeing now, and for so long] (personal communication, 2017). From January to March 2017, the unemployment rate was registered at a record 13%, or nearly 13.5 million people (Reuters, 2017).

When Brenda was laid off, she was no longer able to afford a private health insurance plan: *"eu tive sempre a possibilidade de pagar um plano de saúde para garantir que você vai ter acesso ao serviço, porque o*

governo não cumpre a parte dele, e não garante esses serviços através dos impostos que você paga" [I always had the possibility of paying for a health plan to guarantee access to service, because the government does not do its part and doesn't guarantee those services that you pay for through taxes] (personal communication, 2017. In Brenda's view, she couldn't rely on the government, and purchased a private healthcare plan that became unaffordable when she was laid off. Indeed, more than 2.9 million Brazilians lost their private health care plans subsequent to the economic recession (Massuda, et al., 2018). Like many people in similar situations, she had to resort to the public health care option: *"por conta do meu desemprego, eu cortei o meu plano de saúde privado. Agora eu só tenho a saúde pública, com o que contar."* [as a result of my unemployment, I cut my private healthcare plan. Now I only have public health care to count on] (Brenda, personal communication, 2017). As demand for services increased, funding by the government for SUS decreased, resulting in a shortage of doctors, fewer available services, and longer wait times (Massuda, et al., 2018). As stated by Brenda,

> *"as filas são muito grande, a quantidade de pacientes que você vê que precisam muito mais do que você, você fica constrangida de estar ali porque você vê pessoas que estão realmente doentes, ou feridas, sem atendimento rápido, não existe urgência para que eles sejam atendidos."*
>
> [The lines are very long, the number of patients that you see that need much more than you, you feel embarrassed to be there because you see people who are really suffering or injured and there is no urgent care, there is no urgency to attend people] (personal communication, 2017)

Brenda had to resort to using health services provided by SUS in late 2016. By that time, she had already given birth to her son, who was born healthy and without complications. Other people were not as fortunate. As the country was in economic recession and amidst a political crisis, the Zika epidemic was at its peak. In addition to high rates of the Zika virus infection, an unprecedented

number of children born with microcephaly began to be reported, prompting a public health crisis by the country's Ministry of Health and the World Health Organization.

Brenda recognizes that the city of Recife is prone to epidemics:

> *"a cidade do Recife é muito propícia para um desenvolvimento de uma epidemia dessas, porque ela é transpassada por dois rios, a cidade inteira, o rio Capibaribi e o rio Beberibi, e por falta de saneamento básico, todos os dejetos da cidade, seus esgotos vão direto para o rio, e fazem com que o rio seja na verdade uma fossa a céu aberto"*
>
> [the city of Recife is favorable to the development of epidemics like these, because it is crossed by two rivers, the whole city, the Capibaribe river and the Beberibi river, and because of a lack of basic sanitation, all city waste, sewers go directly into the river, and makes the river an open sewer] (personal communication, 2017)

In other words, Brenda is acquainted with the political ecology of the Northeast. That is, a lack of infrastructure and adequate sewage sanitation systems rooted in government incompetence combined with the city's natural environment create favorable conditions for the proliferation of mosquitos and the viruses they carry.

In Brenda's case, she took all precautionary measures to avoid the mosquito during her pregnancy:

> *"Mas, apesar disso, eu não tive esse temor do vírus Zika, porque tomei os cuidados que poderia tomar. Vivo num lugar não tão próximo assim do rio, não tão à margem, por mais que só de viver em Recife você já esteja um pouco exposto, mas não vivo num lugar com tantas plantas ou na margem do rio, e tomei cuidados naturais de não reproduzir o mosquito na minha casa."*
>
> [But despite that [political ecology of Recife], I did not fear the Zika virus because I took the precautions I could take. I live in a place not so close to the river, not so close to the river banks, only by living in Recife, you are already a little exposed, but I do not live in a place

with so many plants or on the riverbank, and I took natural care not to reproduce the mosquito in my house] (personal communication, 2017)

Communities that live near or on the riverbanks of the Capibaribe and Beberibi rivers are more exposed to the unsanitary conditions of these waterways, which are ideal breeding grounds for the disease vectors, the *Aedes agypti* mosquitos. People that live in the *palafitas,* or stilt houses, in the favelas along the river tend to be lower-income and darker skinned. In turn, many people that were infected by the Zika virus and had children born with microcephaly, were primarily low-income, darker-skinned women.

According to Brenda, the government's response to the Zika epidemic was not practical, as it focused too much on temporary vector control, like fumigation campaigns and using the military to make house visits. She viewed it more as a publicity stunt, *"como sempre, respondeu com uma preocupação de mostrar na mídia o trabalho deles, do que fazer um trabalaho efetivo"* [as always, it responded with a concern to show the media their work, that they're doing effective work] (personal communication, 2017). From her point of view, a practical response does not exist: *"Enquanto na prática, em ações práticas, de limpeza da margem do rio, de oferecer condições sanitárias, de higiene básicas à população, que realmente fossem efetivas nesse combate, o investimento era mínimo, ou inxistente"* [whereas in practice, in practical actions, in cleaning the river banks, offering sanitary conditions, basic hygiene for the population, that would be really effective in combating the disease, investment is minimal, or does not exist] (personal communication, 2017). While Brenda recognizes that she was fortunate to minimize exposure to the disease, she believes the only way to truly tackle the issue of disease epidemics in Brazil is to invest in infrastructure, public health and education.

Mulher

The contrasting experiences of Andrea and Brenda may reflect the racial and economic inequalities that are pervasive in the Northeast. The story of Andrea mirrors the reality of most of

the people that were affected by the economic, political, and public health crisis of 2016, that is, people most affected by these crises were low-income, dark skinned and female. This scenario is not unique in the Northeast, but rather an ongoing cycle given the precarious political ecology of the region. In other words, the Northeast's natural environment combined with the spillover effects of a weak State, mainly its failure to provide basic public goods, tends to fall on the backs of women living in poverty and who are dark skinned. From Andrea's story, we can glean that her class, race and gender contributed to her exposure to the Zika epidemic and possibly her child's microcephaly. While both Andrea and Brenda were adversely affected by the turmoil in Brazil, their experiences were categorically different. Brenda, who was middle class and lighter skinned, was in a socioeconomic position that allowed her to avoid exposure to the Zika virus vector and had access to comprehensive health care throughout her pregnancy. What is more, Brenda, although unemployed, had financial support from her family and could rent out her apartment to supplement her income. While these are just two cases in the Northeast, the differing experiences of these women may reflect the racial inequalities that exist in the Northeast. Indeed, a precarious political ecology doesn't "only reflect existing inequalities, but it may also insidiously reinforce them in the long-term." (Bryant, 1999, p. 26). The long-term effects of the Zika epidemic are yet to be seen; however, the environmental conditions of the Northeast, augmented by the political, economic, and public health crisis that unfolded throughout Brazil only exacerbated the inequalities that have historically existed in the Northeast as illustrated by the stories of Andrea and Brenda, both *Mulheres Nordestinas*.

CHAPTER FIVE | Conclusion

This research sought to analyze how an abrupt political transition, in tandem with an economic crisis and a public health crisis affected organizations and people, especially when you factor the political ecology of the Northeast's *zona da mata*. Specifically, this research attempted to answer three central questions: First, how did the shift in national politics in 2016 affect public health policy in Northeastern Brazil during and after the Zika epidemic? Secondly, how were government and non-governmental organizations dealing with the Zika virus impacted by the policy shifts between the Rousseff administration and the Temer administration? And more importantly, how did these policy shifts affect people?

Figure 17. By E. Camarena. (2017) Slums and Condominiums along the Capibaribe River.

In the context of the Northeast, the region's political, economic, and social factors were conducive to the Zika epidemic in 2015. Zika spread throughout Brazil and many Latin American countries at an alarming speed (Heukelbach, et al., 2016) prompting the World Health Organization to declare the Zika epidemic a Public Health Emergency of International Concern (Nebehay and Hirschler, 2016). The Northeast region of Brazil was the hardest hit by the epidemic, illustrated by the concentration of microcephaly cases reported in the region (Diniz, 2016). The public health crisis in the Northeast also magnified the socioeconomic issues that have historically affected the region. Mainly, that the Northeast has been deprived of resources and development since it lost its economic significance after the demise of the sugar industry in the 17th century (James and Faissol, 1956; Goldsmith and Wilson, 1991). In the case of Recife, capital of the Northeastern state of Pernambuco and the site of my research, the presence of mosquitos and the disease they can carry, such as dengue, chikungunya, and yellow fever (McNeill, 2010; Cavalcanti, et al., 2015; Nunes, et al., 2015) are a product of the region's poor infrastructure, lack of adequate sewage sanitation, and tropical climate. The epidemic had a socioeconomic, racial, and gendered effect since marginalized communities tend to be more exposed to unsanitary living conditions (Souza, et al, 2017). In other words, the epidemic magnified the intersectionality of race, poverty and gender.

The theory of political ecology serves as a theoretical lens to view the Zika epidemic and its uneven effect on different segments of society in the Northeast. This concept can be understood as the consequential relationship between the natural environment and the political economy of a region. As reflected by the Zika outbreak in the Northeast, the region's political ecology not only exposed the existing inequalities, but also reinforced them (Bryant, 1992, p. 26). Recife's environment combined with the political, economic, and socio-historical elements of the region created the ideal conditions for the proliferation of the Zika epidemic, which had a socioeconomic, racial, and gendered effect on marginalized communities, and further reinforced the already existing

inequalities of the region (Bryant, 1992, p. 26). Furthermore, Brazil's inability to adequately address the public health crisis and consistently provide necessary public services questions the strength of the State, which can be measured by "democratic consolidation, the rule of law, economic growth, and adequate provision of basic public goods" (Giraudy, 2012, p.599). The adequate provision of basic public goods is most pertinent to the case of Northeastern Brazil, since the guarantee of services changed drastically between the Rousseff and Temer administrations. As stated by Kurtz and Shranck, "the degree to which a state's institutional capabilities are institutionalized, rather than being dependent on the particular individual or partisan occupant of executive office" can reflect the strength of a State (2012, pg. 616). In the Northeast of Brazil, a precarious political ecology weakened the State's ability to deliver public services, affecting primarily women. This complements the idea of a feminist political ecology, which factors the gendered effect into a political ecology framework (Rocheleau, et al., 2013).

At the meso level of analysis, the political and economic crisis affected organizations amidst the Zika epidemic. In particular, the political ecology of the Northeast affected government and nongovernmental that were coping with the fallout of the Zika epidemic. The term *policy fields* groups both non-profit and governmental organizations that dealt with the fallout of the zika epidemic. Policy fields can be defined as "an identifiable set of elements in a specific environment that directly shape local public service provision" (Stone and Sandfort, 2009, p. 1054).

The Zika epidemic in the Northeast combined with an economy in recession, the *Lava Jato* corruption scandal (Watts, 2017), and public protests against the massive costs of the Olympics (Phillips, 2016) created the perfect political storm to proceed with the well-crafted impeachment proceedings of Dilma Rousseff, ascending Temer to the presidency. While Rousseff introduced austerity measures (Romero, 2015), the classic neoliberal economic model was fully embraced by Temer (Fox, 2017). This shift is best illustrated by PEC 55, a constitutional amendment that freezes

public spending for twenty years (Sims, 2016). Public hospitals and universities faced steep budget cuts, that forced massive lay-offs, a reduction of public services, and a loss of research funding. In the view of many people interviewed, there was a complete regression of public policies (personal communications, 2017). Similarly, NGOs also had to lay-off staff, terminate community programs, and scramble for other sources of income, primarily from other governments and international non-governmental organizations in order to remain operational. The cutback of available funding to public and non-profit organizations translated to a cutback of available services these organizations could provide. As summarized by Dr. Castro, the government has gone back on its word: *"o governo volta atrás"* (personal communication, 2017). As multiple reports and studies show, the people most affected by the cutback of services were primarily low-income, darker skinned, and female (Castro, 2018; Diniz, et al., 2017; Diniz, et al., 2012; HRW, 2017; Souza, et al., 2018).

Chapter Four illustrated two contrasting experiences of two women who were affected by these crises. The first woman was Andrea, who was pregnant during the peak of the epidemic and gave birth to a child with microcephaly. Andrea happened to be dark-skinned and low-income. She lived with her family in a low socioeconomic city near Recife and made multiple visits per week with her daughter to the seek treatment for the various conditions associated with microcephaly. I met Andrea at the Altino Ventura Foundation (FAV), where her daughter would get treatment for ophthalmological disorders and physical therapy. From Andrea's perspective, the Brazilian government has largely failed to assume its responsibilities of providing public health care services, adequate infrastructure and sanitation systems, and reliable access to potable water, especially during time of crisis (personal communication, 2017).

Brenda, who was also pregnant during the Zika epidemic, gave birth to a healthy child. Brenda happened to be lighter skinned and middle class. She lived in multi-story apartment building in a middle-class neighborhood, where it was relatively clean and distanced from the city's many

open water ways. During her pregnancy, Brenda took all possible measures to reduce exposure to the mosquito. She worked at an office for a government agency and was able to afford a private health insurance plan to cover all prenatal care. She gave birth to a healthy child. As a result of the political and economic crisis, Brenda was laid off her job and subsequently was unable to afford her private health insurance plan. When I met Brenda, she had been unemployed for over six months, and was living off of savings and aid from her family. To supplement her income, she rented out her apartment through a shared hospitality website. While the Zika epidemic did not directly affect Brenda, her livelihood and access to comprehensive health care were impacted by the political and economic crisis.

As reflected by Brazil's sociopolitical reality, the economic, political, and public health crisis exposed the Northeast's precarious political ecology, which saw the convergence of poverty, race and gender. The story of Andrea reflects the reality of many people affected by the Zika epidemic. That is, a disproportionate number of affected people were low-income, darker skinned, and female. While both women were negatively affected by the turmoil in Brazil, their experiences were very different. Brenda, who is middle class and lighter skinned, was fortunate to have the resources to avoid exposure to the Zika virus vector and had access to comprehensive health care throughout her pregnancy. The differing experiences of these women may echo the racial inequalities that exist in Brazil. Given that I was only in Recife for six weeks, two cases certainly do not reflect the whole situation of the racial, socioeconomic, and gendered effects of the public policy on the Northeast's *zona da mata* and requires further research.

Policy Implications

"Políticas públicas estruturantes e estruturadoras"

The Zika epidemic reflects a history of disease attributed to the Northeast's political ecology, illustrated by the region's poor infrastructure, lack of adequate sewage sanitation, inconsistent delivery of potable water, access to comprehensive health care, and the unique environment of the *zona da mata*. Every person interviewed for this research acknowledged these are the underlying issues that must be addressed by the regional and national government to prevent future public health crises. As concisely said by Dr. Paes, physician, professor, and researcher at UFPE, *"nós precisamos políticas públicas estruturantes e estrutudoras"* (we need public policies that construct and are constructive) (2017). The first point refers to the need for public policies centered on infrastructure to address the Northeast's precarious environmental living conditions. Investment in infrastructure, in turn, are constructive for the development of society. Research shows that investment in infrastructure has direct economic benefits, such as stimulating the economy, creating jobs and increasing productivity (Munell, 1992). Indirectly, infrastructure investment has far-reaching environmental benefits (Himlim, 1997; Bond, 1999) and improved public health outcomes – especially those related to water and sanitation (Butala, et.al., 2010). Investments in infrastructure can also reduce gender inequality (Bond, 1999), given that women tend to be most affected by a precarious political ecology (Rocheleau, et.al., 2013).

Figure 18. By E. Camarena. (2017) Public protest. Recife, Pernambuco.

In the context of the Northeast's *zona da mata*, the economic, political, and environmental

conditions that triggered the Zika epidemic had a gendered effect, yet policies to address the public health crisis centered only on temporary vector control and overlooked a comprehensive approach to tackling the epidemic and its root causes. This requires political will, which according to several people interviewed, is nonexistent. In addition to investments in infrastructure, increasing access to reproductive health care (RHC) can have remarkable benefits for women, families, and society (Singh, S., et al., 2014). Research shows that access to RHC helps women plan their births leading to improved maternal and child health, educational, and economic outcomes (Canning, 2012). Furthermore, RHC reduces the number of unintended pregnancies and unsafe, or clandestine, abortions (Singh, S., et al., 2014, p. 12). According to the United Nations Population Fund, RHC incorporates comprehensive sex education, contraception, prenatal and post-natal care, treatment of STIs, and access to safe and legal abortion (UNFPA, 2016). As pointed out in a study on RHC in relation to the Zika virus outbreak in the Northeast, access to RHC has declined, especially for low-income women in the region (Borges, et.al., 2018). This may be linked with the rise of conservatism and an extreme shift to the right in Brazilian politics, first with Temer and then with the election of Jair Bolsonaro.

O Brasil hoje **– Brazil today**

Jair Messias Bolsonaro, of the conservative Social Liberty Party (*Partido Social Liberal* [PSL]) was elected president of Brazil in 2018 after a contentious election solidifying Brazil's shift to the extreme right (Faiola and Lopes, 2018). Since becoming president, Bolsonaro has lifted environmental regulations protecting the Amazon, terminated the More Doctors program (*Mais Médicos:* MM), and signaled a reform of Brazil's pension system (Londoño and Casado, 2019; Darlington, 2018). Brazil's new political reality threatens the viability of Brazil's Unified Health System which provides universal health care to majority of Brazilians. As a result of the constitutional amendments enacted by Temer that restrict increases to public spending, funding for

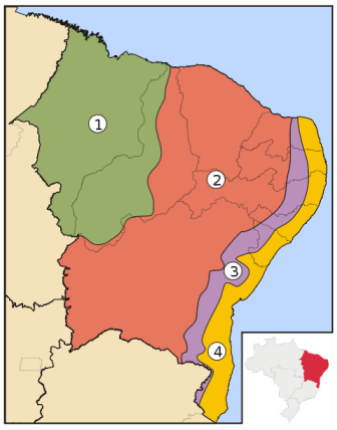
SUS may limit the ability to provide health services to its citizens and ultimately become obsolete. This would inevitably have negative implications on Brazil's most marginalized communities who depend more on these services. The long-term effects of the Zika epidemic combined with the political and economic crisis are yet to be seen, but the fact remains that little was made to improve the infrastructure of the Northeast, and rather than increase access to health care services, public policies like the constitutional amendment denies additional funding to SUS. These conditions leave not only the Northeast exposed to future epidemics, but more so, *mulheres nordestinas*.

I returned to Vila de Nazaré for my final days in Pernambuco. Here, away from the chaos of city life, I could more clearly gather my thoughts on everything I had seen in Recife, a city with great historical significance, with rich culture, with warm and welcoming people. I also witnessed a city continuously dealing with its history of social, political, and economic inequalities compounded by a constantly changing environment. I left Recife knowing that *Nordestinos* are a resilient people, illustrated by a quote I was told in response to the current situation in Brazil: *"nossa aposta é que a gente continue, mesmo mal das pernas"* [our bet is that we continue, even with bad legs] (personal communication, 2017). Despite the inequalities that are pervasive in the Northeast, many people remain steadfast, with or without the aid of government. Even so, when are the government's discrepancies too much to handle? What will happen when the next epidemic surfaces? How will climate change manifest itself in the Northeast? I leave Brazil with these questions in mind and a strong feeling that I will return to find out.

fim.

APPENDIX

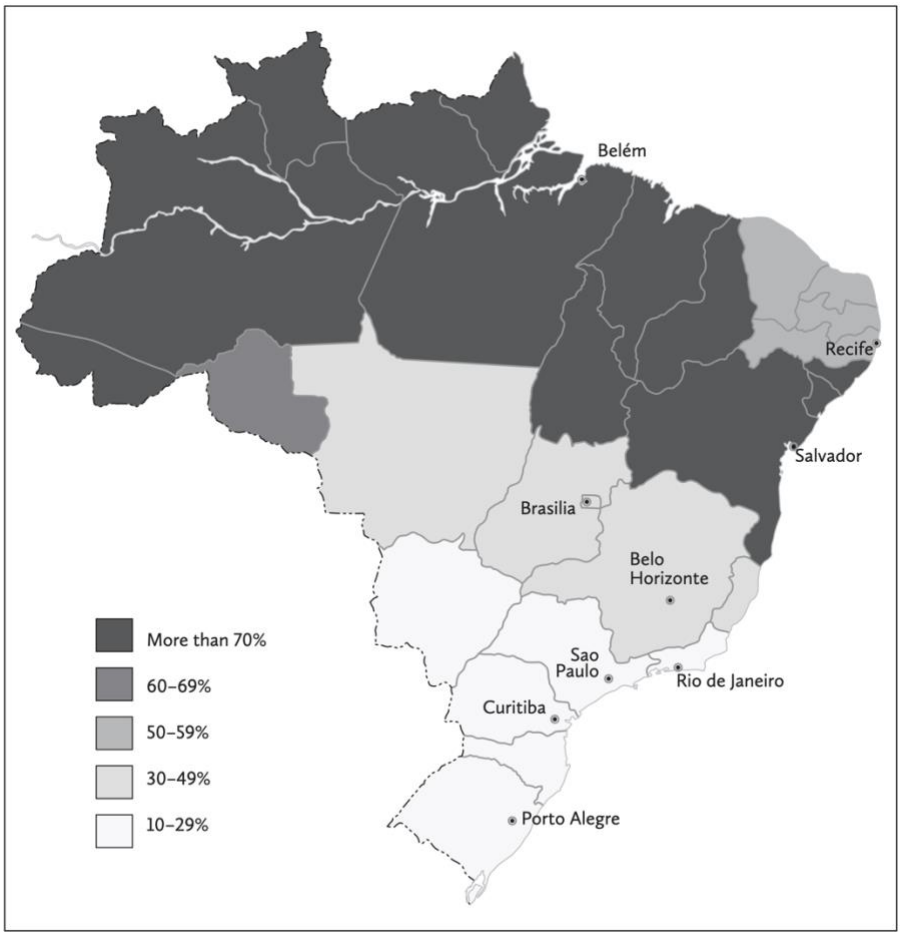
APPENDIX A



By Raphael Lorenzeto de Abreu (2006) Sub regions of Northeastern Brazil. [CC BY-SA 3.0 (http://creativecommons.org/licenses/by-sa/3.0/)]

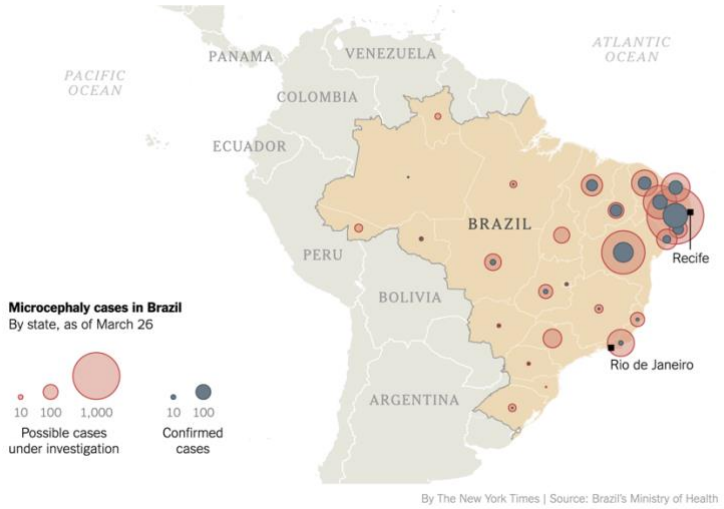
Key
1. Meio-Norte
2. Sertão
3.Agreste
4. Zona da Mata

APPENDIX B



By Moraes Silva, G., Paixão, M. (2014) Percent Black or Brown in Brazil, by State, Source: Census of Brazil, 2010

APPENDIX C



Microcephaly cases in Brazil, Source: Brazil's Ministry of Health (2016, March 26). *The New York Times*, Retrieved from https://www.nytimes.com/interactive/2016/health/what-is-zika-virus.html

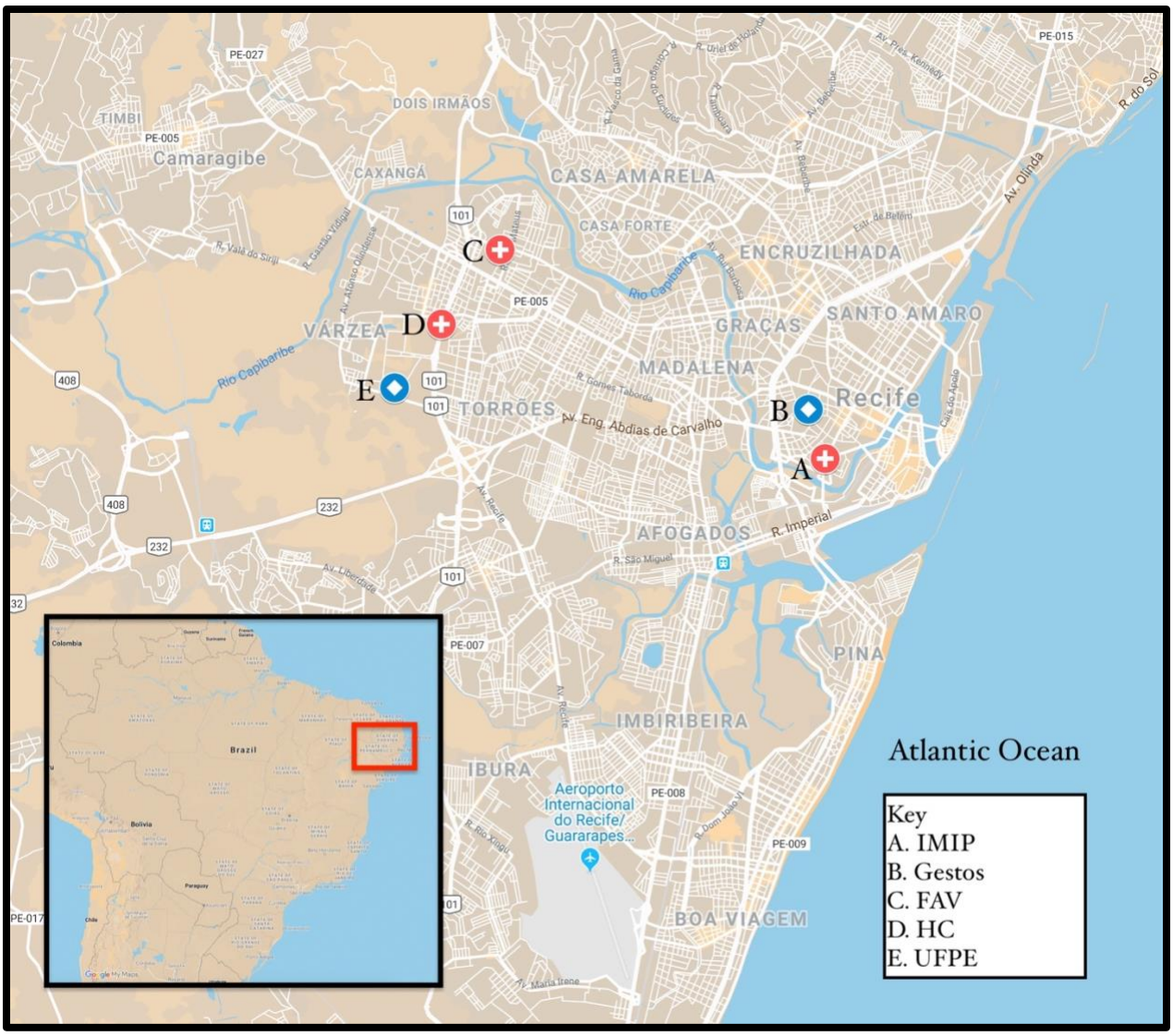
APPENDIX D

ID	Unidade da Federação	Microcefalia com suspeita de infecção pelo vírus Zika				Total de municípios com casos notificados (n)
		CASOS		ÓBITOS		
		n	%	n	%	
REGIÃO NORDESTE		**3.113**	**88,19**	**46**	**100**	**605**
1	Alagoas	149	4,22	---	---	52
2	Bahia	450	12,75	10	21,74	83
3	Ceará	192	5,44	1	2,17	48
4	Maranhão	119	3,37	1	2,17	52
5	Paraíba	569	16,12	10	21,74	104
6	Pernambuco	1.236	35,01	6	13,04	152
7	Piauí	62	1,76	1	2,17	25
8	Rio Grande do Norte	181	5,13	12	26,09	48
9	Sergipe	155	4,39	5	10,87	41
REGIÃO SUDESTE		**190**	**5,38**	**---**	**---**	**57**
10	Espírito Santo	32	0,91	---	---	11
11	Minas Gerais	19	0,54	---	---	15
12	Rio de Janeiro	122	3,46	---	---	21
13	São Paulo	17	0,48	---	---	10
REGIÃO NORTE		**82**	**2,32**	**---**	**---**	**37**
14	Acre	Sem registros	---	---	---	---
15	Amapá	Sem registros	---	---	---	---
16	Amazonas*	Sem registros	---	---	---	---
17	Pará*	6	0,17	---	---	4
18	Rondônia	Sem registros	---	---	---	---
19	Roraima	1	0,03	---	---	1
20	Tocantins	75	2,12	---	---	32
REGIÃO CENTRO-OESTE		**144**	**4,08**	**---**	**---**	**24**
21	Distrito Federal	5	0,14	---	---	1
22	Goiás*	7	0,20	---	---	7
23	Mato Grosso	129	3,65	---	---	14
24	Mato Grosso do Sul	3	0,08	---	---	2
REGIÃO SUL		**1**	**0,03**	**---**	**---**	**1**
25	Paraná	Sem registros	---	---	---	---
26	Santa Catarina	Sem registros	---	---	---	---
27	Rio Grande do Sul	1	0,03	---	---	1
Brasil		**3.530**	**100**	**46**	**100**	**724**

Fonte: Secretarias de Saúde dos Estados e Distrito Federal (atualizado em 09/01/2016). Dados sujeitos à alteração.
* Unidades federadas que atualizaram os seus registros com valores inferiores ao publicados anteriormente, após reclassificação dos casos.

Centro de Operações de Emergências em Saúde Pública [COES] sobre Microcefalias. (January 1, 2016). Informe epidemiológica (SE) no.8. Retrieved from http://portalarquivos2.saude.gov.br/images/pdf/2016/janeiro/13/COES-Microcefalias---Informe-Epidemiol--gico-08---SE-01-2016---Valida----o-12jan2016---VALIDADO-PELO-CLAUDIO--e-com-os-estados-por-webconfer--n.pdf

APPENDIX E



By Google. (n.d.) Recife, Pernambuco, Brazil, research sites.

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